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THE SANITARIAN,

AND

ORGAN OF THE

MEDICO-LEGAL SOCIETY.

A MONTHLY MAGAZINE,

DEVOTED TO THE PRESERVATION OF HEALTH, MENTAL AND PHYSICAL CULTURE.

A. N. BELL, M.D., Editor,
T. P. CORBALLY, M.D., Associate Editor.

VOLUME VI.

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THE SANITARY INTERESTS OF THE PUBLIC SCHOOLS OF NEW YORK.

Proceedings of the New York Medico-Legal Society, October 3d, 1877. Prof. FRANK H. HAMILTON, M.D., LL.D., President, in the Chair.

Final Report of Special Committee on Legislation, appointed March 3d, 1876, read by R. J. O'Sullivan, M.D.

At the stated meeting, held June, 1877, it was announced that the Committee on School Hygiene would present to the Society, as soon as practicable after the vacation, a synopsis of its labors since its appointment.

It might be well to refer here to an incident, trivial in itself, yet of interest, since it was the beginning of the effort of this Society to ameliorate the condition of school children, and thereby promote the interests and health of the entire community.

At the meeting in February, 1876, Mr. George H. Yeaman read a paper entitled "State Medical Polity," which was followed by discussion, during which a member conversant with sanitary affairs in relation to schools made some remarks, which were published in full in the *New York Sun* of February 27th, 1877.

That enterprising journal sent a representative to the Board of Education, to investigate the subject, which elicited the following information:

When the attention of President Wood, of the Board of Education, was called to the report printed in the *Sun* of Sunday, in which was set forth the dangers to which school children are exposed through the insufficient ventilation and capacity of the school buildings, he said that what was therein stated was correct. "We are raising children to kill them. As long as the law permits children of four years of age to attend school, the primary schools will remain overcrowded, and will continue to be merely nurseries, as they are to-day."

At the meeting of this Society in March, the following Committee was appointed: George H. Yeaman, A. N. Bell, M.D., R. J. O'Sullivan, M.D., R. S. Guernsey and D. S. Riddle. At the April meeting a report was made, in which it was stated that a communication had been sent to the President of the Board of Education, which was printed in full in the minutes of the Board, and subsequently in the transactions of the Society.

The Committee was continued, by unanimous vote of the Society, and made frequent reports of progress until the meeting in October, when the second report was read. This report was published in full in the *Herald;* and the wide circulation thus given it elicited much public interest in the topics discussed.

On January 3d, 1877, a public meeting was held, under the auspices of the Society, at which some interesting reports and papers were read and discussed, which were afterwards published in full in the proceedings of the Society.

At the subsequent meetings, reports of progress were made, which were duly acted upon.

From the reports made at a meeting of the Board of Education at the beginning of the school term, the fact was ascertained that in one ward alone over 1,200 children were refused admission to the schools for lack of accommodation. In the fourth school district last year a large number of children were refused admission for a similar reason.

Thus many thousand children were unable to receive the benefits of a free education, owing to the fact of there being no school-room for them. These facts deserve careful study by the public, especially by those who desire to secure to their offspring the advantages of public education.

Upwards of $3,500,000 were expended last year for school purposes. Among the items, according to the estimate for 1878, the following appear: Salaries of professors, teachers, etc., Normal College, $90,000; for nautical schools, $35,000; enforcement of Compulsory Act, $20,000, and we may add $150,000 for the College of the City of New York.

These items are mentioned in order to show that these departments (which do not necessarily enter into the plan of the Common School system) involve annually a large expenditure, which might better be devoted to the more pressing needs of the system—namely, the erection of plain, substantial primary schools, with proper sanitary appliances for the protection of the pupils. Large play-grounds should, as far as practicable, be provided, and in improving present school houses, or in building new ones, they should be surrounded on all sides with adequate open space to secure light, ventilation and play-grounds. These extra expenditures would go far to supply the school-room now absolutely needed for elementary education.

In the reports on diseases of the eye in schools, read before the Society, some of the results of this system of higher education were shown—viz.: Cramming, ill-ventilation, and overstrain of the visual organs. One item will suffice to illustrate this point. The College of the City of New York, which is the head of the male departments of the common schools, as the Normal College is of the female departments, may be considered an example of the startling results of their unsanitary condition. In the New York College, 21.9 per cent. in the introductory classes were near-sighted; of Freshmen, 26.2 per cent. were near-sighted; Sophomores, 22.7 per cent.; and of Juniors examined, 50 *per cent.* were near-sighted.

In the Normal College, examination reveals the following facts: 26.67 per cent. were near-sighted; 11.04 per cent. far-sighted; while 62.29 per cent. were in a normal condition.

An interesting fact was brought out in this examination: that, dividing all the scholars into the three great classes, American, German and Irish, there were found of the Irish 14.28 per cent. near-sighted; American, 19.35 per cent., and Germans 23.23 per cent. near-sighted; other nationalities gave 19.58 per cent. In other words, we have the Germans presenting the largest percentage of near-sight, Americans next, and Irish least of any.

The inference is plain that the results expected from these institutions are marred, and that the impaired vision of the candidates for the position of teacher, and the young men who graduate from the New York College, must necessarily tend gravely to impair their future usefulness, if it does not eventually end in loss of sight.

On a former occasion we referred to the compulsory law in these words:

"It is to the primary departments and schools that these children are compelled to go, according to the law, regardless of sanitary requirements or class-room accommodation, and failing to do so, must go to prison."

The injustice of enforcing this law, under these conditions, must be obvious to any reflecting mind; indeed, it may be doubted if the higher courts of justice would willingly enforce a penal law at the risk of the health or the lives of those who cannot obey because room is not provided for them. As an illustration of this, there were at the beginning of the vacation of 1876 forty of these unfortunate youths in prison.

The Medico-Legal Society, in advocating the sanitary reform of schools, rendered an important service in directing public attention to this subject.

The results already accomplished are evinced in the interest manifested by the public in their sanitary management. The Society, in entering on this branch of State Medicine, opens a wide field for its labors, which cannot fail to redound to its credit, and to the advancement of the objects of its organization. The immediate purpose of the Society, in endeavoring to promote this reform, cannot be better expressed than it has been in the concise and excellent language of the President, Dr. Hamilton, in the opening of the discussion, at the public meeting, January 3d, 1877, an abstract of which we subjoin.

He introduced the subject by remarking that a few words seemed to be necessary, by way of explanation, to those gentlemen, not members of the Society, who were present. "The subject of the sanitary condition of the schools of this city came before us as one of the matters properly included in the term 'State Medicine.' And whilst we have, in the main, restricted our studies and debates to questions of medico-legal science, we have always held that it was within the purpose of our organization to consider any question of importance appertaining to State Medicine, of which medico-legal science is, strictly speaking, only a branch. In addition to this, we have the common right of citizens to inquire into all matters which affect the public interest.

"Our action cannot, therefore, be regarded as an officious interference with the duties of the Board of Health, or the Board of Education, or of any other of the State or municipal authorities. We claim the right to examine and to suggest modifications of the laws, or im-

provement in the management under the laws, in all things relating to the hygiene of our schools, whenever and wherever such modifications or reforms seem to be required.

"We have entered upon the consideration of this subject with no predetermination to find causes of complaint, but only to be assured that, while the State does its duty in securing education for all classes, it does not impair the health or destroy the lives of these precious children, upon whom the happiness of families and the prosperity of the city depends, nor that the schools become centres of infection, from which disease may be spread throughout the land.

"I believe, gentlemen, I may be permitted to say that, thus far, our investigations into the condition of our schools in this city have in no degree humbled our pride or abated our Pharisaical pretensions. Nevertheless, we have defects—weak points in the masonry, want of cohesion in the iron, lack of strength in the trestle-work, which the architect and engineer, who crossed the bridge an hour before us, failed to see. We, the medical half of our Society, claim to be experts in matters of hygiene, and that we can see some things that others cannot. We believe we see defects, some of which are trivial, and might easily be remedied; others more serious, and apparently more difficult to remedy, at least without additional legislation. It is apparent, for example, that under the present law, rendering attendance at school obligatory, and which law most good citizens desire to see, in one way or another, enforced, the crowd and strain upon the schools is excessive, and either the pressure must be relieved or the whole structure must give way."

In February, 1877, two bills were introduced in the Legislature; one in the Senate, by the Hon. James W. Gerard, providing for the appointment of an Assistant Superintendent of Schools for medical supervision in the city, which was modified to the appointment of an Assistant Sanitary Inspector for each school district, to be made by the Board of Health. In this form it unanimously passed the Senate.

The Hon. Elliot C. Cowdin, in the Assembly, introduced the bill fixing the minimum age of admission to the public schools at six years, and limiting the attendance to one session a day of children under eight years of age. The advantages to be derived from the last-named bill have been fully demonstrated in our second report, and also in our subsequent report at the June meeting, from which we quote a brief abstract.

"Of children under the age of six years, there are now upwards of 17,000 attending the lower grades in our public schools, who could not fail to be greatly benefited by the enactment of such a law, as will be seen for the following reasons:

"The children return to school in the afternoon, after partaking of a hearty dinner, often fatigued by play, and, during the warm months, overheated, so that the afternoon session is a tax on the vitality of both teachers and scholars, without any corresponding mental benefit.

"Those interested in the health of school children may satisfy themselves as to the correctness of these statements, by observing the little ones on these sweltering days, returning to school after the noon recess, exposed to the burning rays of the mid-day sun; whilst in the school, to be cooped up in crowded rooms during the entire afternoon, without any recess, in constrained positions, being crammed for the

annual examination, tortured by drill exercises for exhibitions (the usual programme at the close of the school year), in order to gratify the vanity of school officers, who seem determined to run these schools regardless of the physical well-being of the pupils and the requirement of sanitary laws."

In this connection there is one point of interest to which we called attention in our first report, April 5th, 1876:

"Not only are the children subjected to the tortures and annoyances already mentioned, of over-crowded and ill-ventilated class-rooms, etc., but frequently, before school is dismissed, the Janitor and his assistants begin their work of sweeping and cleaning, raising clouds of dust. As soon as this work is finished, and after the dismissal of school, the doors and windows are closed immediately, thereby preventing proper ventilation. Thus the children are compelled to re-breathe this poisoned atmosphere on their return to school the next day."

Previous, however, to the introduction of the bills already referred to, the Committee had, by appointment, an interview with the President of the Board of Education, and submitted to him a draft of the bills. After a careful examination he cordially approved of them, and assigned cogent reasons for their passage.

Subsequently we were not a little surprised to learn through the press that the Board of Education had protested against their passage, which protest was appropriately replied to from the Senate Chamber by Senator Gerard, who stated in a communication to the Board of Education that there was a very general interest manifested by the public in this subject. The district School Inspectors were not qualified to perform sanitary inspection; that their suggestions made in their annual reports received no attention; they were simply placed on file, and that was the last ever heard of them. He (the Senator) would rather hear their reasons than their protests.

Notwithstanding this action of the Board of Education, at their meeting in June last, a resolution was passed asking the Board of Health to inspect the schools, and report to the Board of Education.

In February, according to the Board of Education, there was no necessity for sanitary inspection of schools, and in June they invite the Health Board to make this inspection.

We have been credibly informed that some of these officials were never seen in the ground class-rooms of the primary departments in the more densely populated school districts during their term of office.

If this statement be correct, how could intelligent legislation be expected, under these circumstances, in relation to the sanitary interests of the schools?

In the year 1873, the Board of Apportionment, at the instance of Comptroller Green, made an appropriation of $5,000, which amount was to be expended in sanitary improvements; but it was subsequently withdrawn, owing to the failure of an agreement by the Committee on Warming and Ventilation of the Board of Education, in awarding a contract for the performance of the work.

Prior to this action, a conjoint inspection of all the schools under the jurisdiction of the Department of Public Instruction was made by the physician of the department, and two Inspectors of the Board of Health.

These reports were under the consideration of the Committee on Hygiene, when the department was abolished by an Act of the Legislature, and since that time the reports have remained pigeon-holed, the present Board of Education taking no action upon them.

Thus, for four years, these schools have been deprived of sanitary inspection. The Board of Health has been censured for not making the inspection, and insisting on the sanitary improvement of the schools.

The probable explanation of this inaction is, that the Health Board deem it the duty and sphere of the School Board, and left the responsibility where it very properly belonged.

In this connection a recent issue of the *Medical Record* has the following pertinent remarks:

"The Board of Health, in compliance with a resolution from the Board of Education, has made a sanitary inspection of the school buildings of this city during the vacation. As a result, sixteen of these have been found wanting in sanitary requirements, and have been referred back to the Educational Board for action. We cannot resist the conviction that this will probably be the end of the matter. It is well known that the Board of Education has been adverse to sanitary inspection in every form, and has, during all the time the matter has been under discussion, defiantly maintained that it was capable of looking after its own affairs, of which it claimed this sanitary inspection was one. This is past history. What the future will be is of course purely inferential, but we believe that there is very little chance for reform. The resolution asking for sanitary inspection was ostensibly a bid for public favor and as an offset to the defeat of the Sanitary School bill, which was thought to be a reasonable measure by every one else, save those composing the Board of Education. The Health Bureau is merely asked for recommendations, and when these are made, they can be accepted merely in the light of official courtesy, and filed accordingly. Beyond this nothing can be done save by the pleasure of the Educational Board, as that body alone has the power to enforce any regulations, either for the mental or physical well-being of the children. Judging the future by the past, the outlook is discouraging. What is the use of making recommendations without the power of enforcing them?"

It is plain from these facts that but little can be expected from the action of the Board of Education with regard to the sanitary interests of the schools, and that the legislation which has emanated from this Society is the only feasible means of solving this difficult problem.

Probably in no city in the civilized world, more particularly in popular centres, has the medical profession less influence than in the city of New York; especially is this noticeable in the spheres in which their studies and experience naturally incline medical men to take an active part in matters pertaining to public health. An instance will suffice to explain our meaning.

In the fall of 1875 an application was made to the then incumbent of the Mayoralty, by some of the most eminent medical men of the city, to appoint, as a member of the Board of Education, a physician whose experience in school sanitation would, in their judgment, conserve the sanitary interests of the schools.

This reasonable request was denied. The profession continues

unrepresented in the Board of Education; this is an injustice. The claim of the medical profession is as good, and, in some respects, better, than that of some other interests and professions now represented in the Board. Lawyers, bankers and politicians are there, but no physicians; the physical wants of 100,000 children require the services of a trained sanitarian in the central Board of Education, who would aid materially in the enforcement of sanitary law, and would not fail to prove a useful member.

Mayor Schroeder, of Brooklyn, recognized this fact in appointing our colleague, Dr. Bell, as a member of the Board of Education of that city.

It is hoped that the present worthy Mayor will recognize the claim of the medical profession to a representation in the Board of Education of New York.

In conclusion, we would earnestly solicit the co-operation of our colleagues on the law side of the house, to aid in obtaining this recognition, and the legislation referred to in this report.

R. J. O'Sullivan, M.D.,
George H. Yeaman,
R. S. Guernsey,
D. S. Riddle,
A. N. Bell, M.D.

New York, October 3d, 1877.

Ventilation of Cow-Stables.—Proper ventilation is indispensable to health of cows both summer and winter, and to cleanliness in milking. If stables are without ample openings over the cow's heads, the pressure of air from without drives the noxious odors from their voidings and the venomous exhalation—perhaps from old, stale urine, under loose, squashy floors—forward to their heads, where they are compelled to inhale them. Such stables are unfit to milk in, because the milk, while milking, will imbibe those odors, and unfit it for good cheese or butter. From my observations in searching for causes of the ailments that cows are liable to, I have come to the conclusion that more disease is generated by venomous atmosphere in damp, ill-ventilated stables than all other causes. As a preventive, I would advise that the floor of the stable be laid upon a solid bed of earth and gravel, with a fall of six inches in twelve feet from the stanchions, with the same ratio of descent, to a point for outlet of liquids, with a platform raised six inches for cows to stand and lie on. The floor and platform plank should be bedded in water-lime mortar, so there shall be no soaking down nor hiding-place for stale urine to deposit and generate venomous odors.

Openings in the sides of stables are useful in warm, still weather, and to dry and cleanse them; but should not be relied on for breathing air, for they should be closed in severe weather to prevent currents of air striking the inmates, which should always be avoided. An opening forward and over their heads large enough to fodder through the whole length of the stable is little room enough for circulation of breathing air, and would not draw through in currents unless the siding is open below and too airy above.—*Willard's Butter Butter.*

THE INFLUENCE OF THE MOVEMENT OF SUBTERRANEOUS WATER ON HEALTH.*

By Baldwin Latham, C.E., M. Inst. C.E., F.G.S., F.M.S., Etc.

In the course of a most exhaustive paper on the above head, the writer remarked that the subject of the influence of subterraneous water on health was one of very considerable importance, and of almost universal application. By subterraneous water was meant any free water found beneath the surface of the ground, regardless of the depth at which it might be found. Pointing out that, even under the most favorable conditions, all subterraneous water was subject to two movements—first, the vertical rise and fall, and, second, its horizontal projection—the writer observed that these movements, when compounded, made a wave line, or a series of wave lines, dependent upon the periods of the exhaustion and replenishment of the water. The vertical rise in the subterraneous water was due to the replenishment of the springs by rainfall; and the subsequent fall of water was due to the loss of water by its flowing out of the strata into the rivers or sea, as spring water; and also by its evaporation from the surface of the ground, to which it was conveyed by the capillarity of the strata. The horizontal movement was due to the effect of gravity, all the free water of the earth having a tendency to gravitate to the lowest levels, usually to the nearest stream, or to the sea. To some extent, but as a rule only in the case of deep-seated springs in porous strata, capped with impermeable beds, the direct movement of subterraneous water might be interfered with by reason of geological faults in the strata; but where there were such interferences there was generally some clue as to the nature and influence, which was usually exercised not in stopping, but in simply limiting the drainage areas, or diverting the flow from what otherwise would be its natural outlet. All subterraneous water was due to rainfall, and the quantity of this water at any time present in strata depended upon the rainfall, and other meteorological conditions. Very limited areas on some very porous geological formations were speedily affected by rainfall, and received in proportion a larger amount of rainfall than was the case with some larger areas; but all those limited areas which were quickly replenished by rainfall, were the areas soonest exhausted in time of drought. The store of underground water accumulated during the winter months, and was exhausted in the summer and autumn months. The period, however, varied with the season, and with the nature of the strata. It would be obvious to the most casual observer, that, knowing there were currents of water silently flowing under the surface of the ground, those currents might be productive of numerous in-

* Read before the Sanitary Institute of Great Britain, at Leamington, October 5th, 1877.

fluences, either for good or evil, under certain circumstances. The earth might be kept clean and free by such currents, which removed vast quantities of both mineral matter and organic *débris*. At the same time, having regard to the vicious habits of man, they tended to convey, spread and concentrate local pollution, to the general detriment of the health of communities. Owing to those movements of subterranean water, it was doubtful if any local supply of water taken for domestic purposes from a superficial well could be used, at some times, without serious danger to the health of the persons using it in its natural state ; and, even in the case of deep-seated springs, it was well that they should always be traced to their source, as there appeared to be no limit to the distance the contagious matter of disease might be transmitted underground, as no amount of filtration would apparently remove the contagia. Apart from the carrying capacity of subterraneous water to convey impurities from place to place, and so to render the water wholesome, it would be found that as the waves of water passed through the earth, the highest elevation of the crest of the wave was coincident with the greatest amount of disease of a certain class, such as phthisis ; and that, on the other hand, widespread epidemics of cholera, diarrhœa and fever were coincident with the lowest water levels. There were, however, cases known in which undue elevation of the water level led to increased movement of the subsoil water, and to the disturbance of filth stored in the soil, and had been followed by epidemic outbreaks of fever. As a rule, the healthiest condition existed in those districts in which the water line was well removed from the surface, and in which it never fluctuated in its elevation, and where the water was not stagnant. The writer proceeded to say, *inter alia*:—"Water in itself does not change in the earth, but becomes noxious by reason of carrying and distributing infectious matter, and also giving rise to certain conditions that are favorable to organic processes being carried on in the soil, or which affect the temperature, humidity and quality of the ground atmosphere, which, in its turn, is not without its influence on the air of our dwellings. The knowledge of the influence of water in contact with soil in producing malaria has also been made use of in war, and in an early period of history we find that resort was had to the encouragement of malarious influences created by water for the destruction of enemies. There has been a vast amount of evidence collected in malarious countries, all of which tends to show that so long as any surface is entirely covered with water, no evil follows ; but so soon as the water subsides and the surface becomes dry, malaria, with its fevers, is the sure and certain result. The movement of subterranean water is a subject which has not received very much attention. There are, however, a sufficient number of instances on record to show that water may become seriously polluted by reason of carrying impurities from imperfect sewers, cesspools, burial grounds, and other foul sources, and a knowledge of the direction of the flow of the moving water may in some cases enable us to secure health ; on the other hand, ignorance of the direction of the flow may lead to very serious consequences. In districts in which the water-supply is taken from local wells, the construction of imperfect or leaky sewers will not necessarily tend to improve the sanitary

condition of the place. An instance of what a leaky sewer could do in propagating cholera occurred at Sandgate, in 1854, when sixty people died from this disease out of a population of about 1,000 persons. The disease followed the line of the main sewer, and, "it was discovered afterwards that the joints in the tubes in the main sewer had leaked in consequence of an obstruction, and that the water had infiltrated the surrounding soil, contaminating the water in some of the houses." It is within the limit of a fair estimate to say that at the present time there are hundreds of miles of drains and sewers every year laid in this country that are by no means impervious, and the construction of which leads to the pollution of the subterranean water. No wonder, therefore, that many districts that incur great outlay for sanitary works never appear to reap any advantage for their outlay, for the simple reason that the influence of the pollution of the subterranean water has been entirely overlooked. The influence of intermural interments is not without its effects on the health of those located within the influence of the drainage of a cemetery. A tale was related some years ago in *Chambers' Edinburgh Journal*, which, written as fiction, has all the reality of experience. It sets forth the frightful influence of a crowded cemetery located in a populous neighborhood in Paris, the soil of which was raised by the dead of centuries to the level of the second floors of the contiguous houses, and it was recounted that "no young children could be reared there, and some out of every family of new comers were sure to die within the twelvemonth." These are facts which observation shows to be the usual concomitant of such insanitary arrangements. With reference to cemeteries, it should be observed that those the soil of which are best adapted for the destruction of organic bodies, are those which by their porosity are most likely to lead to the pollution of the subterranean water, the effects of which may be carried to considerable distances; and while we are not without evidence of how the dead have poisoned the living, the fact cannot be overlooked that at the present day cemeteries exist and are still being located in such positions in reference to the subterranean flow of water, and the habitations of the living, as to seriously compromise the sanitary well-being of many places. If "mutiplied coincidences are tantamount to positive proof," then it is clear that in the undeviating water line we must ascribe the healthiness of the places to which reference has been made. We cannot, however, entirely be unmindful of telluric influences, and that in all probability the ground water influences the ground air, and ground air very naturally influences health. The unhealthiness of cellar dwellings has been admitted in this country. Statistics go to prove that ground floors are more unhealthy than the upper floors. This has been established very clearly in the case of soldiers living in barracks. The healthiest quarters are on the upper floors; so that we must not overlook the influence of the ground in promoting or aggravating disease. In what way does a fluctuating water line affect the quality of the water? A constant level means a constant quantity and constant quality. A fluctuating level means a fluctuating quantity and fluctuating quality. If we hold with Dr. Richardson, F.R.S., that the poison of disease is organic and particulate, and is formed in the process of disease, and

that the poison is capable of dilution and destruction, and with concentration becomes noxious, we can well understand when the water is lowest in the subsoil there is the greatest concentration and the greatest likelihood of it being noxious and producing disease. On the other hand, if we hold with those who say that disease is due to living germs, and that enteric fever, as shown by Dr. Klein, is accompanied with a fungoid growth in its mycelium stage, to which the disease has been ascribed—we know that for the development of the higher orders of fungi, all of which have their mycelium stage of growth—contact with earth under such conditions as are secured in the dark recesses of a damp soil is essential for their future development, and a fluctuating water line brings the fungoid germs such contact with the soil. The quantity of the soil through which the water flows or in which it fluctuates appears also to have an essential bearing on the results that follow. It is essential for health that in all cases in which a water-supply is derived from wells, we should know from whence the water flows to us and the condition of its fluctuation, and that all our sanitary works should be executed with reference to the movement of the subterranean water, so as to secure the very best conditions for a healthy existence.

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Nassau—the famous winter resort for invalids—is the chief of the Bahamas, a group of about 600 islands, which form the northernmost section of the West Indies. New Providence, the capital of Nassau, and seat of government for all the Bahamas, extends along the water-front for about three miles, and back to the crest of a slope, on which stand the government house and many of the finest private residences, at an elevation of 90 feet above the harbor. The streets are laid out at right angles with each other, and are uniformly macadamized, as are also the numerous excellent drives around the island; the houses are generally built of stone, with the surrounding ground ornamented with a tropical profusion of flowers and trees.

Its climate is remarkably healthy, and the winters are delightfully mild and equable, without being depressing. The temperature never falls below 64° F., nor rises above 82°, and the variation rarely exceeds 5° in the 24 hours. Little rain falls in the winter months, which are almost uniformly dry and clear. Not the least attractive feature of Nassau is the *Royal Victoria Hotel.* It is of stone, four stories high, and each of the first three stories is surrounded by a broad piazza, forming a continuous promenade over 1,000 feet long, and affording to those unable to endure the fatigues of out-door exercise ample facilities for enjoying the fine scenery and refreshing breezes. The rooms are large and carefully ventilated, and the house has all the modern improvements. Convenient arrangements for sea-bathing exist, and for such as prefer it, salt-water baths, both hot and cold, are provided in the hotel.—*Appleton's Hand-Book of Winter Resorts.*

Nassau may be reached, from New York, direct, by Murray, Ferris & Co.'s line of steamers; office, 62 South Street.

THE PRESENT POSITION OF SANITARY SCIENCE, FOR ITS FUTURE PRACTICAL ADVANCEMENT.

ADDRESS ON HEALTH.*

BY EDWIN CHADWICK, C.B., PRESIDENT OF THE HEALTH SECTION.

It will be my duty to submit to you, as well as I may, from my own point of view, the present position of sanitary science, for its future practical advancement.

A Stationary Death with a Largely Increased Population, a Reduced Death-rate.—It has been recently put forward by a gentleman who held this chair at Liverpool, that notwithstanding all the expense incurred by local authorities for sanitary works, there has been little alteration in the death-rate during the last forty years. In great part this is true, and I may show why it is so; but the figures are misleading, for with an increase of the population during that period, from about fifteen to twenty-two millions, with extensive conditions of overcrowding of dwellings of the wage classes, and of cottages which formerly served for one family, but which have now frequently one family to each room, there have been augmentations of death-rates at many points, insufficiently countervailed by reductions at others. It will be found that a stationary death-rate is, relatively a largely increased population, a reduced death-rate. But the statement is, as I shall show, so couched as unjustly to depreciate our increased power of sanitation. Then we have had the doctrines of Malthus raised against us, and it is held forth that by increasing the population we shall by division diminish its subsistence fund and intensify misery. Those doctrines were pressed for application when the population was one-third what it now is. They were again pressed as of increasing necessity, when it was one-half what it now is. In what comparative condition of comfort would the population now be, and of prosperity and strength would the nation be, if it were now as it then was? In my service in Poor Law administration, I had to deal practically with those doctrines. In one county we at once struck off 10,000 able-bodied men from the pauper roll of outdoor relief in aid of wages. The Malthusians declared that wages must be reduced by that measure, and that its working must be horrible. But lo! wages, instead of falling, rose higher than they had ever been before. In the very county where the objection was raised the population has been increased during the last half century from half a million to upwards of two millions, wages have been doubled, and until the late check to manufactures and population

* At Twenty-first Annual Congress of the British Social Science Association, Aberdeen, September 13, 1877.

—productive population—had become scarce, as I foretold it would be. I might add that if by sanitation the population were increased to the extent foreboded, why then, as it is estimated, that of the habitable parts of the globe only one-sixth is really believed to be inhabited, we shall have sufficient outlets for the superabundance of a strengthened population. Noting the fact that at the period of the promulgation of the population doctrine, epidemic visitations were regarded as "positive checks," absolutely unpreventable and uncontrollable—I beg attention to the progress made in the development of the powers of sanitation in absolute prevention; especially as bearing on those visitations. In our first meeting at Birmingham, in 1857, Lord Stanley, now the Earl of Derby, referred to my official Report of 1842, on the sanitary condition of the laboring population, in terms with which subsequent dedication to me of works on the subject—of which I prize most the dedications by officers who have served with me—have concurred, in accepting that Report as the starting point of public effort in sanitation. I therefore propose to submit examples of the development of those powers, since that period. Our general death registration is defective in itself, and it is yet more defective for our present purpose, because in the same registration districts, houses situate outside sanitary works which have had no amendment are mixed up with others in areas which have been so amended, and it is hence very difficult to obtain distinct and just conclusions in respect to the results of such works. We may, however, see more clearly the operation of principles, and obtain more satisfactory conclusions, by observing their working on similar classes of persons in similar conditions, as in the army and the navy; or in public institutions under distinct professional observation and care. It is to such instances that I beg to solicit attention. And first as to the prevention of the greatest sources of preventable diseases, "the children's diseases" and "children's epidemics."

A Norma of Sanitation for the Infantile Stages of Life.—In 1838 there fell to the direct administration of our Poor Law Board, of which I was Secretary, two large institutions for the care of destitute orphan children, which suffered severely from passing epidemics or typhus fever. In one, at Norwood, containing 700 children, there was a severe outburst of typhus fever, by which more than a third were attacked, and more than 30 were killed. The general declaration of medical men at the time was, that the mortality was occasioned by deficient food. But the food was better and more abundant than the food of the independent wage classes. I got the case examined by the late Dr. Neill Arnott, who was a specialist in one element of sanitation—ventilation. He pronounced the main evil to be not deficiency of food, but deficiency of pure air, and that the remedy was the constant removal of putrefying matter by good drainage, and of foul air by ventilation. This was adopted, with the result of a reduction of the death-rate by about one-third. Next followed the production of clean skins, by regular head to foot ablutions with tepid water:* and this was followed by the reduction by about another third

* On skin cleanliness generally as a factor in sanitation, see an exposition of mine, made for the Congress on Domestic Economy, held at Birmingham, and published with other papers by the Society of Arts.

of the ordinary death-rates. Other improvements in detail have followed, chiefly in physical training. As sanitary improvement has advanced in these institutions there have been fewer inmates of the sick-wards, to the extent that not a fourth of the beds provided for sickness are now usually occupied. The particular institution first attacked, and now eight other large orphan institutions, district asylums—are in fact children's hospitals, where numbers are received only to die. All the inmates as a class are of the most wretched type of children, all weakly and susceptible to disease; but of those who come in without marked disease, there is now an almost absolute immunity from the "childen's epidemics." Cases of typhus, at one time scarcely ever absent, have not been seen there for several years. The mean death-rates in these institutions have been steadily reduced to about 3 in 1,000, that is to say to nearly one-fourth of the general death-rate of children of the school ages, including the children of the well-to-do classes of the population. It was recently stated, as evidencing the success of the "boarding out" system, that the deaths had not exceeded 2 per cent.; and this probably may be taken as an average children's death-rate for the cottage; that is to say, 20 per 1,000, as against 3 per 1,000 in the district orphan institution, with little variation in the separate institutions. Medical officers in charge of them, but who are in private practice, have repeatedly expressed to me their astonishment at these results of sanitation as surprising and wonderful to them. I was lately present at a prize-giving to agricultural laborers by Lord Shaftesbury, where one prize man was a shepherd, who, out of 100 lambs he had reared, had only lost one. Such emulation may well be directed to the preservation of the human. On a visit to one of these orphan institutions I told the governess of the infants that the Queen of the Belgians had offered a gold medal to whichever manager of such institutions should rear the greatest number of infants, and I asked the governess whether she would compete in conservancy of life against that shepherd with his lambs. She proudly declared that she would do more than that, and with the infants of the ages under her care she really has done more. It is, however, to be noted that the schools are on the half-time principle, which we introduce with the Factory Acts, as preventive of the physical injury done by over-sedentary work in the long-time schools; and I may add that by a better adjustment of the book teaching to the children's mental powers of receptivity, and by the "freshening up" of the faculties by brisk gymnastic exercises and the military drill, these children, though naturally of an inferior mental type, are got well through the three R's in less than four years, as against seven in the common elementary schools, and at half their cost for teaching power; and with the economical outcome, that the efficiency of three is imparted to two for industrial occupations. Formerly, very much from bodily inaptitude, not one out of three got good places; now a very small percentage fail to do so. Here, then, we have a great sanitary norma established, with factors that go to the prevention of an annual excess of upwards of 50,000 deaths in the school stages of life, in England and Wales.

A Norma of Sanitation in Adult Stages of Life.—I would now call attention to another norma of sanitation, for adult stages of the population.

It has fallen to my lot in the course of my early service to examine and compare the results of sanitation in our prisons. Prisons, I need not remind you, were, in the time of Howard, seats of the reputed special "jail-fever," to which not only prisoners, but juries and judges who tried them, have heretofore fallen victims. But now, by clean air, clean persons, pure water, and by regulated regimen, prisons are made seats of health, and display the most conspicuous norma to be kept in view of the power of sanitation in adult life. Sir Robert Christison, the distinguished consulting physician on the prisons of Scotland, declares that the general prison of Scotland, that of Perth, is apparently the most healthy place in the world. He states to me: "The healthiness of the general prison is almost marvelous. I have, down to the present time, inspected it as Government Inspector, six times annually for thirteen years past, and have very seldom indeed found more than one man and one woman in bed, amongst 750 prisoners—once or twice no one!" In the common condition, previously, from such a number of prisoners, a large sick ward would be occupied. He is most emphatic in his expressions of astonishment at the result. I have heard similar expressions from prison surgeons in England, and that they are wont to say of patients in their private practice, "Oh, if I could only have that case in prison, I could save the life." It may be said that the epidemics which ravage the populations under the rule of Baily bodies, vestries, and the like, do not now touch the populations in the prisons under the care of the State. Epidemics rage around them, but do not enter them, unless it be by some extraordinary accident, or some very culpable negligence.

I once met a prison surgeon of our Model Prison at Pentonville, who appeared to be in trouble of mind. I asked him if anything had happened. He had got a case of small-pox in the prison! The disease was then ravaging the courts and alleys in the vicinity of the prison, where as many as a third of the wage classes in some of them were attacked. But this by no means consoled him; a case had no business to be in his prison. A case of cholera occurred in one of the Scotch prisons, and there was a serious consultation about it, and an elaborate speculative report as to how such an extraordinary event could have occurred there. We heard at the Board of Health that there was an attack of dysentery in a prison, and on hearing of it we were perfectly certain that there was misfeasance or culpability somewhere. On inquiry, it turned out that an ill-constructed prison drain had burst into the prison well, from which the prisoners were supplied with drinking water. In the Millbank Prison cases of typhoid fever were at one time frequent, which was traced to sewer-tainted water from the Thames. For the protection of the prison population, this source of supply, to a large proportion of the outside population, was stopped, and spring sources, such as we recommended for the metropolis, were resorted to, with the result that typhoid fever, which continued to prevail amongst the general population of the metropolis, has been long extinguished amongst the population of the prison. In another prison an outbreak of typhoid fever took place, which was found to have arisen from the overflow pipes being connected direct with the main sewer, which conveyed the gas from the sewer to the prison water-tank, so that those gases were absorbed

by the water which the prisoners drank. This connection was severed, and the prisoners were restored to their superior health. But in the metropolis, and other larger cities, from the work of ignorant plumbers, to whom is left the uncontrolled internal distribution of water, the like connections are made by waste or overflow pipes opening into the common sewers, whence the sewer gases of ill-constructed sewers of deposit and consequent putridity are led into the cisterns of the houses under vestral rule—with the continued consequences to the general population from which the population under State sanitary rule are protected. Temperance, or the enforced exclusion from alcoholic drinks (as well as from tobacco), may, it is observed, have claims as factors in the great sanitary results, but to what extent the prison surgeons I have consulted cannot determine, for they have observed similarly good results manifested in the health of female prisoners who have not been gin or beer drinkers, but chiefly tea drinkers.

To prisons, then, we should accustom the health authorities to look as strongholds of attained, and attainable, sanitation. About two-thirds of the prisoners, as appears in Scotland, enter the prisons with disease upon them, often in advanced stages. Eliminating these cases, we may get a measure of progress from the military prisoners whose death-rates as outsiders we know. Men have been taken from the ranks, where the death-rates were 17 in 1,000, and put into the prisons, where the death-rates were only 3 in 1,000. I am led to consider, from various evidences, that a death-rate of 3 in 1,000 may be taken as an attained normal death-rate of the adult stages of the life of the ages of the prison populations.

Here, then, we have two great sanitary normas—one of a death-rate of little more than a fourth of the common death-rate in the infantile and juvenile stages of life, and the other of the like proportion in the adult stages. These results of sanitation in the exemptions from ordinary as well as extraordinary epidemics, excite the astonishment of the professors of the curative service. Yet these results are obtained by very rudimentary means, applied, especially in the juvenile stages, by agencies for which high refinement cannot be claimed. On examining these same results it is evident that they are yet susceptible of further advances. Undivided professional attention (which is frustrated by the administrative arrangement which necessitates anxious attention to private practice), and close observation of the comparative experience of several of such establishments, would evolve important contributions to sanitary science. Thus the effects of sanitation, under different conditions of climate, have yet to be observed and discriminated. In one children's institution at Calcutta, similar to those instances cited near the metropolis, a death-rate of about 7 in 1,000—not of a fourth, but of one-half the ordinary death-rate here—has been obtained, which gives good promise of the practicability of rearing children Indian born of British residents, and so establishing succession in our Indian dominions.

Different Species of Disease, attendant on Different Doses of Aërial Impurity.—I obtained observations of one large prison, that of the French prisoners of war in this country, who were confined on the high and fine site for air, the granite of Dartmoor. As the number of prisoners and the crowding of the prison was increased, and in

the then ignorance of the principles and means of sanitation, typhus became rife and dreadfully predominant. As the numbers of the prisoners were reduced by exchanges, typhus was reduced, and finally disappeared; yet phthisis remained, and was prominent, but when the number of prisoners was still further reduced, phthisis was reduced, and on the prison being further thinned, finally disappeared. The apparent immunity from phthisis amongst the reduced numbers of the prisoners attracted the attention of a physician who was a very good observer (the father of the late Dr. Hunt), who applied the fact successfully in his practice. He was wont to send patients who were smitten with consumption up to Dartmoor, and to provide that they should be kept alone in rooms carefully aerated. Cases occurred of whole families in lower sites smitten with phthisis, of whom he could persuade only one to take the remedy of pure aeration, and that one recovered, whilst the rest who remained fell one after another. This great prison presented an example, on a large scale, of the deterioration of the finest air and water by unsanitary treatment; and, moreover, of another important subject needing further observation—the production of different orders of disease in the same air, by different doses of aerial impurity on the same sites and under the same atmospheric conditions.

Progress of Sanitation in the Army.—I now beg leave to submit to your attention the progress of the principles of sanitation under public treatment and collective observation—namely, of our military forces at home and abroad. On the outbreak of the Crimean War I went myself, as the chief executive officer of the first general Board of Health, to the War Office, and ventured to express my doubts as to the sufficiency, not of the medical or curative, but of the preventive service. I was met by assurances of perfect confidence in the completeness of all preparations. In result, however, a victorious army fell, not by the sword of the enemy, but by unsanitary administration. The first outcry was to charge the disaster upon the insufficiency of the rations to sustain the force. A Commission was sent out, and the rations were amended. But good food does not suffice against bad air; the food was improved, but sickness of the troops continued. Independent remonstrances were made by Lord Shaftesbury and others, and by myself in a pamphlet I wrote on the subject for Lord Palmerston.* A Royal Commission, formed of the Chief Staff of trained officers of

* See "Life of Lord Palmerston," vol. ii, p. 81, 82. On February 22, 1855, the late Lord Palmerston wrote: "My dear Lord Raglan—This will be given to you by Dr. Sutherland, Dr. Gavin and Mr. R. Rawlinson, whom we send out to put the hospitals, the port and the camp into a less unhealthy condition than has hitherto existed; and I request that you will give them every assistance and support in your power. They will, of course, be opposed and thwarted by the medical officers, by the men who have charge of the port arrangements, and by those who have the cleaning of the camp. Their mission will be ridiculed, and their recommendations and directions set aside, unless enforced by the peremptory exercise of your authority. But that authority I must request you to exert in the most peremptory manner for the immediate and exact carrying into execution whatever changes of arrangement they may recommend; for these are matters on which depend the health and lives of many hundreds of men—I may, indeed, say thousands." The Commissioners landed in Constantinople on March 6, and immediately commenced cleansing operations in the large hospitals at Scutari, with results fully set forth in their report.

our Board, was sent out, and as a result of the sanitary measures proper, as was declared by the then War Minister, Lord Panmure, the second army was saved, and returned in a better condition of health than the army at home. It marks the antipathy, or at least the apathy, with which sanitation has to contend—of which other large examples may be adduced—that whilst every official through whose misfeasance the first army was lost, was decorated, not one of those through whose sanitary science the second army was declared to have been saved received then or since the slightest notice for the achievement. Chiefly, at the instance of Lord Herbert, under the influence of structural improvements advised by the Army Sanitary Commission, army sanitation was advanced, under more or less perfect provisions, from a death-rate of 17.5 in the year 1858 to a death-rate of 9.06 for the whole army in 1875. The death-rate of the Foot Guards was in 1858 20.4 per 1,000.* It was last year 7.72. The deaths amongst them from continued fevers have been reduced from 2.45 to 0.44, and of tubercular diseases from 12.53 to 1.69 per 1,000 of mean strength. New hospital accommodation, provided on the old experience of the curative service of a constant bed-lying sickness of 100 per 1,000 of force, has been found to be in excess to more than the double of what is now required. The effects of sanitation in the army have been progressively manifested in the army on foreign stations, in some instances to a considerable degree, of which I will mention one—the instance of Gibraltar, where from 1818 to 1836 there was a death-rate of 21.4 per 1,000. Progressive reductions have followed barrack improvements, general drainage, water-supply and other sanitary works there until 1875, when the death-rate was 5.50 per 1,000, and the place is made the most healthy spot out of England for troops. I may here state that at our meeting at Liverpool, in 1858, I read a paper demonstrative of the importance of the application of sanitary science to the protection of the Indian army. The representations then made met with concurrent support, and were followed by the appointment of a competent and efficient Royal Commission of inquiry into the state of the Indian army, in 1859. The report of this Commission stated that the death-rate of the British soldier since the first occupation of the country has oscillated round 69 per 1,000. Dr. Cunningham gives the present death-rates among the British

* It is due to state that Lord Fortescue, in 1856, gave notice of four resolutions on Army Sanitary Reforms, of which the first was: "That the continued excessive mortality of the British army has been mainly caused by the bad sanitary condition of the barrack accommodation"; and the last was, "That in the opinion of the House such increase and improvement of the barrack accommodation are imperatively called for, not less by good policy and true economy than by justice and humanity." In collecting materials for his speech, he visited many barracks and military hospitals; and only a week before the motion was to come on, Lord Fortescue caught the ophthalmia in one of the hospitals, by which he lost the use of one eye. Whilst on a sick bed, he was gratified to hear that a Royal Commission had been issued to inquire into the subject, which presented a very able report, drawn up by its chairman, Mr. Sydney Herbert, before Lord Fortescue was able to make the motion which had been standing *in extenso* on the notice paper before he was taken ill in 1856. That report led to great improvements being at once made by Lord Derby's Government in 1858, which was followed up by subsequent governments; and on May 11th, 1858, Lord Fortescue moved and carried, without a division, the four resolutions which he had given notice of in 1856.

troops in India at 17.48. The average rate of the preceding four years has been 17.65, though 1875 was a great choleraic epidemic year. These are the death-rates in India; but as some die on the voyage home, and others at Netley, the total death-rate has been 18.52. On a threatened invasion of our West Indian possessions by cholera, we were called upon at the General Board of Health to organize a Sanitary Commission for defense. One result of that examination, chiefly conducted by Dr. Gavin Milroy, was to show that the excessive ordinary death-rates there (50 in 1,000), and the assumed impossibility for the white races to live and have succession there, were mainly the results of unsanitary conditions. The army sanitary statistics are confirmatory of that view. In the Leeward command the death-rate was, from 1819 to 1836, no less than 96 per 1,000. Great improvements have been made at all the stations of late years, and the management of white troops has been much improved. In 1875 the death-rate was 5.98 per 1,000. As in the prisons, so in the barracks, it may now almost be said that epidemics are not permitted there. Whensoever any occur there, an inquiry is made as to the causes, with a view to their removal, whilst epidemics carry away thousands of the civil population, the industrial forces of the country, without any proper inquiry whatsoever.

Shortcomings in Army Sanitation.—The foregoing results may be accepted as great and telling demonstrations of the power of sanitation; but in the service of this science we should reckon nothing done whilst aught remains to do. For sound fault-finding is promotive of further progress, and with our knowledge of the subject, we should change our aspect of felicitation to an aspect of severe discontent with the short-comings of the administration. It may be demanded why the death-rate of the Foot Guards should be 7.72! Why should it be above that much-exposed service, the police, which has now a death-rate of only 5 in 1,000, instead of 11, as formerly? Why should the death-rate of the Foot Guards be above Gibraltar, which was 5.50? There are yet fevers in the barracks, combined with other diseases, which ought not to be there any more than in the prison—there are some 50 per 1,000 constantly sick amongst the selected strong lives of the barrack, and not above 10 per cent. amongst the unselected and low and bad lives of the prison, even with the diseases brought with them. Then we have yet a death-rate of 9.36 for the whole of the home army! such a contrast to Gibraltar—strong, selected lives, a death-rate even threefold greater than the wretched population of the prisons! This, surely, ought not to be, and with due support to the sanitary administration, which has done so much, it would not be.

A Norma of General Sanitation in a Tropical Climate.—In respect to the sanitation of the Indian army, I may present one norma for use. Some time ago I was informed of an example of the power of sanitation on a tract of land in Algeria, which it was necessary to occupy, and, if possible, to colonize for stratagetical purposes, where, however, three sets of colonists had been swept away, and three sets of military force dislodged by a death-rate higher than the worst that ever prevailed amongst our army in India. Subsequently the place was skillfully drained, supplied with water and appropriately cultivated, with the result that the malaria and the malarial fevers were nearly abol-

ished, and the birth-rate made as good as in a rural district of France, and, indeed, to exceed the death-rate of the colonists; and the death-rate of the soldiers was reduced to about 13 in 1,000. At my instance, our then Minister of War, Lord Ripon, directed the place to be visited and the work to be examined by a special Commission, on which were Dr. John Sutherland, Lieut.-Col. Ewart, R.E., Dr. Paynter and Mr. Robert Ellis, C.B., of the Sanitary Commission of Madras. But that I was prevented by illness, I deemed the example so important, that I should have accompanied them. By them the results were verified, and pronounced to be generally applicable to India. It showed that for the protection of soldiers, sanitation must extend beyond the four walls of the barracks, to the cantonments and to the habitations of the connected populations.

To go with an army under unsanitary commands is to incur threefold greater danger of death from disease than from the sword. To go with a working army, for settlement under sound sanitary commands, is for the settler to go with threefold greater security for himself and family against disease—tropical disease—than if he went alone.

Not solely by the one recited norma of sanitation, but on other evidence too long to recite, I believe that the death-rate of the Indian army and its sickness-rate, are yet at least full one-third higher than it ought to be, or will be hereafter under a good administration. The present loss from defective army sanitation amounts to between four to five hundred deaths annually, and the preventable sickness of some 1,600 or more of our small and valuable force. Added to these are the enormous losses of civil population from the dereliction of governmental duty in respect to them, and the inaction arising from administrative ignorance and apathy, which has its pretext for inaction in the assumed difficulty of overcoming the habits of the population, and the ignoble assumption that ignorance is impregnable.

Economics from past Army Sanitation.—All the short-comings may be treated as waste of military as well as of civil force, which have to be measured by the gains derived from past sanitation. Let me state some of the gains of military force so obtained, as indications of future practical economy from sound sanitary administration.

The death-rate of the home army was 17 per 1,000 up to 1857. This, on a man-strength of 88,147 men, gives 1,840 deaths. But the actual deaths were only 870, showing a saving of 670 men—a battalion, nearly. At £100 per man, this represents a saving of £67,000 per annum in the home army. As to the Indian army, the latest returns show that it amounts in round numbers to 60,000 men. A death-rate of 69 per 1,000 implies 4,140 deaths per annum; but at the present rate, all told, at 18 per 1,000 per annum, there would be required only 1,080, or 3,660 fewer deaths than under the old death-rate, and on the calculation of the Royal Commission, this gives an annual saving of £366,000 per annum, which ought to be half a million under effective sanitary administration. The army was smaller; but under the old unsanitary, and merely curative rule, there would have been 10 per cent. of sick, that is to say, 6,000 men out of an army of 60,000 always in hospital. At present the numbers are 3,360, too many by one-half; but it shows, nevertheless, three battalions of men more in the effective

strength of the army than would have been the case formerly with an army of the present strength.

Progress of Sanitation in the Royal Navy.—I now advert to the progress of sanitation in the Royal Navy. Dr. Johnson, now just a century ago, thus spoke of it: "As to the sailor, when you look down from the quarter-deck to the space below, you see the utmost extremity of human misery; such crowding, such filth, such stench. A ship is a prison, with the chance of being drowned; it is worse, worse in every respect; worse air, worse food, worse company." This, which was said of the Royal Navy then, may be said of the mercantile marine now. Such events as occurred in Anson's time may be stated to be impossible in the Royal Navy, in which now the death-rate from disease alone in the total force was, according to the last report, 6.9 per 1,000. This is little more than one-half the death-rate prevalent amongst the men of the same ages of the civil population. Nevertheless, it appears to me that the progress of sanitation in the navy is yet unsatisfactory. It was 6 per 1,000 as early as 1830. In 1835 it had been got down to 4.9. Some observation in experience of the preventive vigilance exercised in the transport of pauper emigrants when payments were made only on the numbers landed alive, and a consideration of the species of disease yet too prevalent in the Royal Navy—under former conditions denoted by Dr. Johnson's expression, the mortality on board transport ships was terrific. The Indian government have now, however, sanitary troop-ships for the outward voyage, in which the death-rate from disease is under 3.0 per 1,000. Indeed, the transport returns for 1876-7 show a death-rate of 2.6 per 1,000—that is to say, about the same death-rate as in the best-ordered prison on shore, and less than half the death-rate in barracks; less than a third of the death-rates of the wage classes under corporate rule, and this with no greater than 50 cubic feet of space. Of course, enforced temperance in the floating prison, as in the stationary prison on shore, has much to do with this; but there are no epidemic outbreaks in these ships. On the return voyage, many of the men who are sent home as invalids or on sick leave land quite recovered. Making all allowances for differences of exposure to external contagion, the death-rate and sickness-rate prevalent amongst the selected population of the movable prisons afloat ought, I consider, to be brought much nearer to the normal sickness and death-rates of the unselected, primarily diseased and altogether inferior populations of the fixed prisons on shore.

(*To be continued.*)

BERMUDA.

Within three days' travel from New York it is hardly possible to find so complete a change in government, climate, scenery and vegetation as Bermuda offers. The voyage may or may not be pleasant, but is sure to be short. The Gulf Stream, which one is obliged to cross, has on many natures a subduing effect, and the sight of land is not generally unwelcome. The delight is intensified by the beauties which are spread out on every hand. The wonderful transparency of the water, the numerous islands, making new pictures at every turn, the shifting lights on the hills, the flowers, which almost hide houses that peep out here and there from their bowers, make up a scene as rare as it is beautiful. And so making our way slowly through the labyrinth of islands, a sudden turn brings us into the pretty harbor of Hamilton, which is the capital and principal town of Bermuda. . .

The town is small, not having, probably, more than 2,000 inhabitants. The houses are rarely more than two stories in height, often, or usually, only one. They are almost invariably built entirely of the Bermuda stone—walls, roof and chimneys. The stone is of a creamy-white color, and so porous that it seems as if it would crumble in a day. . . Kitchens and servants' rooms are generally detached from the main house.

There are only two towns in Bermuda—Hamilton and St. George's. Most of the people therein are engaged in trade, but there is no excitement about it. Few business men in Hamilton reside in town, but drive or sail in from homes in the country. At six the town is deserted, and after that hour is a veritable sleepy hollow.

There are about one hundred and fifty miles of good hard roads, which are generally free from dust. The scenery is exceedingly picturesque, and changes continually. . . Great beds of geraniums, which mock our hot-houses in their profusion, grow wild. Hedges of oleander line the roads or border cultivated patches of land, protecting them from the high winds which at times sweep over the islands. Thirteen varieties are found here, and wherever you go it is one mass of pink-and-white blossoms. The passion-flower peeps out from its covert of green leaves, creeping up the branches of tall trees. The profusion of flowers is wonderful, and one can always have a bouquet for the gathering. The winter is the real time for them. About Christmas, the roses, magnificent in size and of great variety, are in all their glory. The beauty and variety of flowers are fully equaled by the excellence and diversity of fruits. Oranges of a superior quality are raised. The lemon grows wild. The mango, guava, papaw, pomegranate, fig, avocado pear—whose lovers (for they can be called nothing else) become eloquent in its praise—the custard-apple, the banana—the lazy man's delight, bearing its wealth of fruit, and dying as it yields its single bunch, while the new plants

springing up about its dead stock maintain the supply the year round—all these fruits grow readily, and with due effort would grow abundantly. . Strawberries ripen from November till July. Grapes grow luxuriantly. . .

From St. George to Hamilton there is a fine ocean drive of eight or nine miles. Going by Harrington Sound, you will pass the Devil's Hole, or Neptune's Grotto, between which and the sound there is a subterranean communication—the sound, by the way, being an arm of the sea. . . . Like most limestone countries, Bermuda abounds in caves, and nowhere are they more beautiful than in Walsingham, not far from Neptune's Grotto, on the road leading around Harrington Sound, one of the loveliest sheets of water imaginable. The whole region is singularly attractive; mimic lakes, reflecting the varied hues of the rocks which enclose them, with trees overhanging their banks, teem with fish wonderful in variety and color, whose motions are the very ideal of grace. By-paths through the tangled wildwood lead one through a wilderness of beauty. Nature has been lavish of her gifts all through this locality, and as it is geologically one of the oldest sections of Bermuda, all the rocks seem to have the weather stain which the vines love so well. Over the whole is thrown the charm of poetry, from the fact that it was one of Tom Moore's favorite haunts while living in Bermuda. It is fitting that Nature should have her temples in such a place. Humility is one of the conditions of entrance to them, and so, bending low, making a slight descent, we are soon standing in a room from whose arched roof hang large stalactites. Artificial lights bring out each in its full proportions, and one contemplates with wonder this strange architecture, regardless of the ages it endured. In a second one near by, and which is much more spacious, is a beautiful sheet of water, clear as crystal and of an emerald tint. . .

Back to the enchanted ground, we lunch under "Moore's calabash tree," hacked by specimen-hunters, but beautiful still. Here he sat and wrote, and so acquired the divine right to all this place. . .

So admirably are the islands situated, that there is no excuse for defective drainage. Strangers usually resort here in the winter, and generally speak highly of the agreeableness of the climate. Rains are quite prevalent at this season, and most houses are not sufficiently protected from dampness, as the native Bermudian thinks fires unhealthy, and sits on his veranda throughout the year. . .

There is almost invariably a good breeze from some quarter, and the nights and mornings are cool and delightful. . . The mercury seldom rises above 85°, or falls below 40°, while the average is about 70°.

There seem to be no diseases peculiar to the climate. . . Consumptives often resort here, but seldom derive that benefit which they experience in a dry climate, though they often improve and in some cases are nearly cured. The climate seems to be especially beneficial to those afflicted with rheumatism and certain nervous diseases. Bronchial affections are generelly relieved and not unfrequently cured.—*Harper's Magazine.*

For Bermuda elegant British Steamships sail weekly from New York. A. E. Outerbridge, Agent, 29 Broadway.

THE MEDICO-LEGAL SOCIETY—ITS STATUS, PURPOSES AND SCIENTIFIC ASPECTS.

ANNUAL MEETING, NOVEMBER 7, 1877.

RETIRING ADDRESS BY PROF. F. H. HAMILTON, M.D., LL.D.

GENTLEMEN: Permit me to mention briefly the leading topics which have engaged the attention of this Society during the year just ended:

The first meeting, in November, 1876, was occupied by the reading of the President's Inaugural Address.

In December, George M. Beard, M.D., active member, read a paper on "Trance, or Somnambulism in its Medico-Legal Relations," which was unfortunately not published in our regular organ, THE SANITARIAN, AND ORGAN OF THE MEDICO-LEGAL SOCIETY, but which appeared in full in the January number of the *Journal of Nervous and Mental Diseases*, Chicago, Illinois.

January 3d, 1877.—A large audience of members and citizens listened to a paper on "Personal Identity," by J. Appleton Morgan, active member, attorney at law and counselor, published in the "organ" of the Society, for January, 1877. At the same meeting, after a brief statement by the Chair, of what the Society had undertaken to do in the matter of school hygiene, a report was made by the committee on the subject. A paper was also read by Professor C. R. Agnew, M.D., by invitation, on the "Defects of Vision caused by Study, and by the Bad Arrangement of Light in the School-Houses." The report of the committee, and Dr. Agnew's paper, are published in the "organ" for March, 1877. A lengthy discussion ensued, in which Mr. James Appleton Morgan considered, especially, the subject of Compulsory Education; Mr. Wm. A. Owen, Principal of the Eighty-seventh Street District School, the Condition of the Schools, and the need of a Competent Medical Inspector, etc., etc.; Robert R. McIlvane, M.D., the Proportion of Blind to the Population, etc.; Moreau Morris, M.D., the Duty of the Health Department in reference to School Hygiene. Full minutes of this discussion will be found in the "organ" for April, 1877.

February 7th, 1877.—Dr. Alfred M. Carroll, active member, read a paper on the "Plea of Insanity," published in the "organ" for June. After which a paper on "Defective Vision in School Children," was read by the Secretary, contributed by invitation by Dr. Edward G. Loring, of this city, published in the "organ" for May, 1877, with the discussion which ensued, conducted chiefly by Jacob F. Miller, Esq., and Dr. R. J. O'Sullivan.

March 7th.—Dr. Samuel A. Raborg, active member, read a paper entitled "Is the Connection of Charity with Correction, in the City of New York, useful? What should be the Policy of a Great City toward its Poor?" Discussed and published in the "organ" for July, 1877, with the debate; conducted chiefly by Simon Sterne, late Com.

P. C., etc., Dr. McIlvane, Hon. Frank Sherman Smith, Judge Fithian and Dr. Raborg. At this same meeting the Permanent Commission reported, through Mr. Yeaman, their reply to the inquiries made by the Philadelphia Obstetrical Society, relative to the laws of this State regulating the conduct of medical witnesses in confidential cases, and to the experience and opinions of the Society as to its practical working and value. The report was accepted and approved.

April 4th.—The Society listened to a paper, by Jacob F. Miller, Esq., active member, on "Medical Experts." No copy of this paper, nor of the discussions which ensued, has yet been furnished for publication. It is too valuable to be lost, and it is hoped that a copy will soon be furnished.

May 2d.—Dr. W. G. Stevenson, of Poughkeepsie, read, by invitation, a paper entitled "Criminality," which, having been discussed, was published in the "organ" for August and September.

June 6th.—Dr. Isaac Ray, of Philadelphia, the distinguished author of "Mental Pathology," "Mental Hygiene," etc., etc., honorary member of the Society, read, by invitation, a paper on "Testamentary Capacity." Published in the "organ" for October, 1877.

September 5th.—Dr. Thomas C. Finnell, active member, addressed the Society on the "Legal Responsibilities of those who administer Anæsthetics." A lengthy discussion ensued. The address and debate are still to be published.

The October meeting being for the annual election of officers, and for the auditing the reports of the officers, no paper was read. At the close of the regular business of the evening, however, on motion of Dr. J. F. Dunphy, the Chair was directed to appoint a committee of five, three of whom should be lawyers and two physicians, to report to the Society whether any farther legislation was required to prevent criminal abortions.

The Chair appointed Drs. John F. Dunphy, James O'Dea, Jacob F. Miller, Freeman J. Fithian and Wm. G. Davies.

At the same meeting, also, the Committee on the Hygiene of the Schools, made, through Dr. O'Sullivan, a supplementary report, which was accepted and approved, and the committee continued.

It will be observed that, under our By-Laws, there are only eight evenings in the year devoted to the reading of regular papers and discussions thereon. Of these papers, the active members of the Society have contributed six, two of which were contributed by the lawyers, and four by the physicians. The two remaining evenings were occupied by distinguished medical gentlemen from abroad (one of whom, Dr. Ray, was an honorary member), both of which papers related exclusively to medico-legal science. There have been presented also, and read, two carefully prepared and elaborate papers on State Medicine, not strictly medico-legal, contributed, on invitation, by medical gentlemen who are not members of the Society, but who are regarded as experts on the subjects upon which they wrote, and whose opinions were thought desirable in connection with the subject of School Hygiene.

All of these papers have been or will be published in our regular organ, except one, as has been already stated, and will constitute, I am constrained to say, valuable matter for reference to the future student of medico-legal science and public hygiene.

The report of the Treasurer shows that, notwithstanding the smallness of the initiation and annual dues and the additional expense incurred for the better accommodation for the meetings of the Society, for the library, including room-rent, the purchase of books, insurance, and a very small salary to the Secretary, the amount of money now in the treasury is larger than is usual at the close of the year. Some portion of the fund, set aside last year for the increase of the library, has not yet been expended, on account of the difficulty of finding those books for which the Society most stands in need.

During the year the trustees have formally taken possession of all the property which could be found, and which, for the want of a home, was much scattered; and having secured a proper insurance, we may feel confident that none of our future accumulations will be lost—certainly not while the present efficient board of trustees remain in office.

I think it my duty to explain why so much of the time of the Society, both at the regular meetings and in the committees, has been occupied with the subject of School Hygiene—a subject which does not come wholly within the original purpose of our organization—and in an attempt to procure metropolitan and legislative action, with a view to its improvement.

It is now more than a year since this subject was brought to our attention by a member of the Society, and a former school inspector, Dr. R. J. O'Sullivan.

And, since then, as a result of our own inspections, and through various communications from those who are interested and possess knowledge upon the subject, our information has accumulated, and the conviction has forced itself upon us, that the condition of our schools is, in certain respects, bad—very bad—and that some remedy ought to be speedily applied.

The evils which we have observed are, briefly: over-crowding, especially in the primary departments; imperfect ventilation; bad arrangement of the light; faulty construction and dangerous proximity of the water-closets; too long confinement in the school-rooms; admission of thousands of children at an age when they ought to be in the nursery or at play, namely, between the ages of four and six years (there are 17,000 children under six years in our school-houses); insufficient and unsuitable play-grounds; the construction of large and expensive buildings on small lots, so that little or no space is left on either side for the admission of light and air.

Most of these evils are remediable at once, under proper laws and intelligent administration; while some of them can only be remedied as new buildings are constructed and the old ones are abandoned.

We are informed that the Board of Education has hitherto paid no attention to the repeated complaints sent to it by the Board of Health; but that the reports of the Medical Inspectors, who have been from time to time detailed for this special purpose by the Board of Health, have been passed unnoticed; at least, they have provoked neither reply nor action. The evils complained of are not remedied—nor does the Board of Health attempt to enforce action by the exercise of its own legitimate authority.

We have reason to believe that our own respectful complaints and

suggestions have been treated in the same manner. In short, we are made to understand that the Board of Education does not recognize the existence of but few, if any, of the evils to which I have referred. If such is the fact, then I think the members of this Society, and probably all who have made themselves acquainted with the hygienic condition of our common schools, will say that the Board of Education, as at present constituted, is either incompetent to judge of what are proper sanitary conditions; or has taken no pains to learn the facts; or is criminally negligent in giving information to the public, and in asking for help to enable it to correct the evils. In either case, with all respect for the gentlemen composing that Board, they are not the proper men for the responsible trust imposed upon them. Nor is it certain that the Board of Health has done all it might do in this matter, to relieve itself of the same imputation.

The insalubrity of school-houses—we beg to remind the Board of Education—may not be recognized by persons inexperienced in these matters, whatever intelligence they may possess in other matters, and who merely pass through the rooms in a "tour of inspection"; but the most inexperienced, even children under six years, will recognize their own discomfort, and the cause of it, if shut up many hours in hot and unventilated rooms—and they will generally contrive, under some pretense or another, to get out into the air. In the same manner, the brakeman or the conductor of a railroad-car, who passes in and out every few minutes, never discovers that the air is overheated or impure, until his attention is called to it by the suffering passengers. The case is very different, however, when an expert hygienist—and all educated physicians are, or ought to be, experts in this matter—enters a school-house. To him a single inspection furnishes all the evidence required; and he might equally determine what the sanitary results must necessarily be, from a mere statement of the facts in any given case.

The medical man alone, also, observes and knows to what extent the various forms of disease to which children are liable, are referable to school-houses and school hygiene. He does not study these diseases and their causes exclusively in the school-room, but in the sick-room, also; where the Board of Education, and the engineer, who is in most cases their only responsible inspector, seldom if ever enter; or, if they did, their opinions as to the causes of the maladies they were permitted to see, would possess very little value.

The intelligent medical man even calculates with almost mathematical precision, and prognosticates the future, so far as the bad hygiene of the schools relates to the future condition of the child.

As he finds that in the large manufacturing towns of England, the children prematurely, and for too many hours, confined in factories, grow up into a race of men and women, short in stature, crooked, rickety, blear-eyed, physically feeble and intellectually dull; so, also, he finds, or, if he has not actually found he has a right to infer, that a similar confinement in over-crowded and badly-ventilated rooms will produce the same results.

We ask for legislation to prevent the admission of children under six years of age.

It may be proper that the city should provide "nurseries" for

children; but it would be easy to show that our school-houses are neither adequate nor suitable for such purposes.

We ask, also, that in the Board of Education, composed of twenty-one members, there shall be at least one medical man, appointed with especial view to his competency. There ought to be two; so that there may be a healthy attrition of opinions, and that there may be also the strength of union, when their opinions concur. One of the qualities essential to the "competency" of such appointee is an ability to stand upright under pressure—back-bone—a quality which is useful everywhere in life, perhaps, but which becomes indispensable when, as in this case, the odds would be greatly against us. I am informed that there are in the Board of Education six lawyers. The members are, therefore, probably well instructed as to their *rights*. We propose, on our part, to teach them some of their *duties*.

There ought to be, also, one Medical Inspector, independent of the Board of Education, assigned exclusively to the inspection of the public school houses.

Thus far our efforts to secure proper legislation and to influence municipal action have failed; but, so far as the Legislature is concerned, at least, we are not without encouragement.

I mistake, however, the temper of this Society, and of those who have been most active in the matter, if there is any disposition to relinquish the effort. The interests involved are too vast—the interests of more than a hundred thousand children; the evils are too great, and the encouragement is too liberal, to warrant a suspension of our labors.

Parents constantly urge us to renewed exertions; school teachers receive us with open arms, and beg us not to withdraw our hands; and the public press, with almost one voice, sustains and encourages us to continue the self-appointed champion and friend of the children.

We have no interest in the schools which every citizen has not. This large body of lawyers and physicians is not seeking to entertain itself and amuse the public by dramatic representations; we want no places, either of emolument or honor; we have no political ends to subserve; but we believe we have discovered great defects in our school system, and we are determined that, if possible, they shall be remedied. Let it be fully understood by all who are interested, and especially by those who, in their long personal experience and endurance of the evils, have become weary of waiting, that we are in earnest, and that we hope and intend to succeed.

It only remains for me, gentlemen, to thank you again for the honor you have conferred upon me, by electing me as your presiding officer during two consecutive years, and for the forbearance you have uniformly shown to me while occupying this chair, and to introduce to you my successor, the Hon. George H. Yeaman—a lawyer, eminent in the practice and exposition of law—late a representative in Congress, and Minister to the Court of Sweden—author of a work entitled "The Study of Government," which must be regarded as a monument of industry, learning and classical taste—a careful student of medico-legal science, and an active member of this Society. He is especially fitted for the place to which you have elected him by your

unanimous vote. Under his guidance, and with the same kind support extended to him which you have extended to me, we have a right to anticipate a period of continued prosperity and usefulness.

INAUGURAL ADDRESS OF THE PRESIDENT—HON. GEORGE H. YEAMAN.

GENTLEMEN OF THE MEDICO-LEGAL SOCIETY:

In accepting the honor you have conferred, and the duties you have imposed upon me, by an election to the Presidency of the Medico-Legal Society, I have to observe that this mark of your confidence and esteem appears all the greater to me because it was expressed at a moment when at least some of you must have known that I was so situated in regard to other duties, and other demands upon my time and care, that I may not be able to give to the labors of the office that degree of diligence and that constancy of attention which their importance would merit, and which my own ardent desire for your success would otherwise cheerfully command at my hands.

Upon this point I am relieved from any apprehension of feeble executive action, by the character and efficiency of the gentlemen selected as First and Second Vice-Presidents.

And yet, upon whomsoever may fall, from time to time, the discharge of these duties within the next year, the incumbent of this chair will suffer by your constant remembrance of, and comparison with, the conduct of the same office by our distinguished out-going President, who has just taken his official leave of you.

It would be useless for me, after the review just made by Prof. Hamilton, to attempt any extended summary or analysis of our last year's labors, nor will it be expected at my hands.

But I cannot refrain, in passing, from congratulating you that your labors in behalf of the health of the public schools, and in the matter of testing and preventing the adulteration of milk, as well as guarding the rights and liberties of those who might be convicted and punished upon insufficient tests, have attracted general and deep interest in this city and elsewhere; while the establishment and working of your Permanent Commission has resulted in the rendition of a full and careful report upon advice asked for by an eminent medical society of a neighboring State, in reference to a proposed amendment of their own statutory law, to protect, as confidential, communications between patient and physician.

As to the future of our Society, I hope there is no reason to fear that it will not be as prosperous, as interesting, as instructive and useful as in the past; and there ought to be ground to hope that increased experience, a more thorough and effective organization, and a longer and better established position in the esteem and confidence of the public, will render your labors and discussions still more useful and effective.

The Medico-Legal Society, as its name imports, is composed mainly of members of the medical and legal professions. It is not a medical society, nor a legal society, nor is it a mere club or social organization. It is strictly a scientific body.

As such, what is its province? While strictly scientific, its intended field of exploration and discussion does not embrace all of

science—not even all of medical science, nor all of legal science. The medical side of this house would scarcely open a discussion here to instruct lawyers whether tuberculosis and scrofula are, or are not, the same disease, attacking or developed in, different parts of the system; nor would the legal side of the house deem the time of this Society well spent in arguing to the doctors either that the New Code is or is not a better system of procedure than the one which it supplants.

Either medical science or legal science is a field of study and investigation, in which we may always learn, always advance, and still the horizon, the boundary of our knowledge, recedes from us, and seems wider in proportion as light becomes greater and clearer.

What is our joint portion of these vast expanses? It is this. At many points of investigation, of practice and discovery, the two professions meet, in so far that light from both is needed for a right solution; and knowledge of both, within certain defined limits, is needed for a correct and successful solution of the problem.

It is these points of common ground, common interest, professional contact, over which, in the technical language of my own profession, this Society may be said to "have jurisdiction"—a jurisdiction assumed by us in the interests of science, our judgments being worth just what our facts and reasons are worth.

Hence, one would naturally infer that medical jurisprudence would be the first and most important subject that would ordinarily and most naturally command our attention. And I believe it is historically true that this was the principal object in view, in the minds of those who organized and called into being this Society, as it was in the field of medical jurisprudence—a discussion and report upon the tests employed to detect poison in a celebrated criminal trial—that this Society gathered one of its first and brightest laurels.

And let no one suppose that these points of contact and mutual interests of the two professions, this limited scientific jurisdiction, furnish a field for inquiry and discussion too small to be interesting or useful.

The recorded lists of your scientific papers, and the official reports of your committees, attest the vast range and variety of the subjects which may properly be discussed here. Insanity, in all its forms, real or theoretical, its relations to legal capacity and legal responsibility, the widest and most varied field of our labors; toxicology, abortion, infanticide, effects of certain injuries from railroad accidents, adulteratien of food, especially of milk, the sanitary condition and government of schools, testamentary capacity—a vast field, expert testimony—another vast field, chloroform as an agent to facilitate robbery, statutory protection of communications between physician and patient, heredity of nervous diseases, reviews of celebrated trials, questions in life insurance, questions of malpractice, and many other subjects of absorbing and vital interest, constantly elicit laborious and careful discussion at your hands.

Nor would I hold that our discussions and investigations should be too closely confined to medical jurisprudence, strictly and technically so-called. I would deem them properly confined only within the limits of those questions or points of mutual interest. One of the questions which has been laboriously investigated and fully discussed

here, the sanitary—or, if some prefer, the unsanitary—condition and management of the public schools, can scarcely be called a question of medical jurisprudence; yet it is, or upon occasion may become, a fit subject for discussion by a medico-legal society.

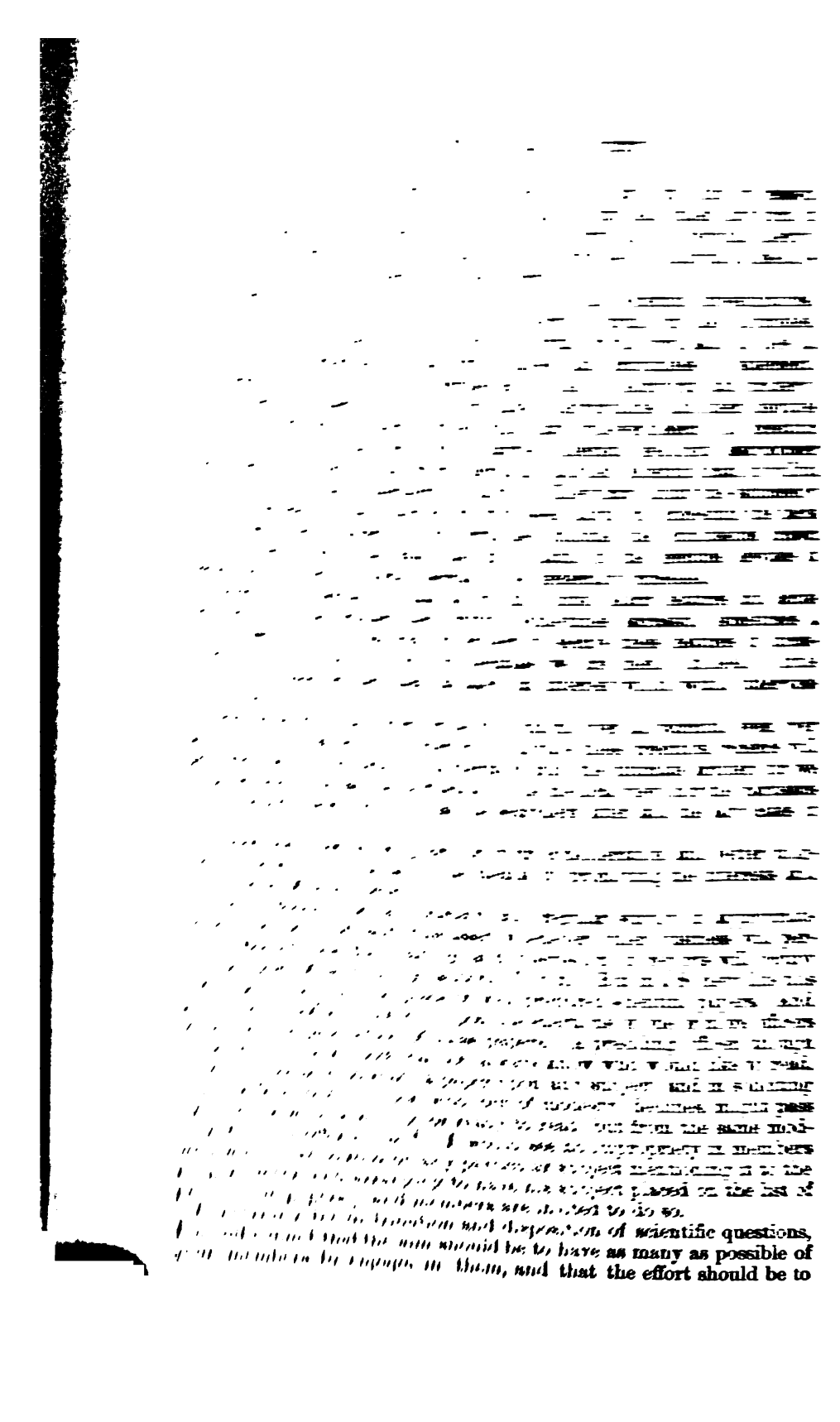
Another subject, embracing the one first mentioned, as well as all kindred questions, subjects of vast range and variety, and of vital importance, sometimes collectively expressed by the term "State Medicine," may properly receive a just proportion of your attention, involving, as it does, the question how far, and in what way, can or ought government to interpose for the protection of the health of the citizen.

If the question be whether better sewerage in the city or better drainage in the country should be established; or whether an artificial pond or lake, intended to adorn a landscape, has not become a laboratory of poison that needs to be abated; or whether blocks and acres of tenement-houses have not been so constructed as to destroy their occupants with typhoid, scarlatina and diphtheria; or whether a plumber has not so exercised the highest skill of his art in arranging the plumbing of a costly house in the fashionable quarter of the city, as to conduct the most of sewer poison in the most direct way into the sleeping apartments—in all these questions there are always two opinions or judgments needed (aside from questions of engineering skill) first, the medical opinion, whether a nuisance, a danger, an evil does exist, and its precise nature; next, the legal opinion as to how the remedy may or can be applied; whether existing laws and regulations are sufficient, if executed; whether there are any vested rights that cannot be encroached upon, even by additional legislation; and whether constitutional amendment may be necessary.

Thus it is that reports from your committees, composed of members from both professions, may be and are made to embrace all the material questions pertaining to a given subject, whether viewed from the medical or legal stand-point. But in enlarging, however little, our field of discussion beyond subjects appertaining strictly and technically to medical jurisprudence, we should be careful not to go too far, and not, by our discussions here, convert this Society into a social science association, in which are discussed all things affecting man as a social being.

Behold the beauty, and the invigorating effects, mentally and morally, of all such investigations and discussions. Science is knowledge—knowledge can only be perception, discovery, comprehension of truth. All truth is akin, related in some way to every other truth or fact in the universe; and every fact casts its light upon, or has its relations with, some other fact or class of facts. The test of truth, the touchstone of scientific reasoning, is the harmony of these relations.

We must apply this to our labors. Lawyers may demonstrate that government has power to do this or that, and may advocate the measure, but medical men may demonstrate that doing it would be an injury instead of a benefit. So, medical men may demonstrate that certain things are extremely pernicious to health, individual or public, and may propose that doing or permitting such things be prevented, or even punished; but the legal profession may interpose the obstacle that, under our form of constitutional government, the



of scientific questions,
to have as many as possible of
and that the effort should be to

have the interest and the responsibility of inquiry and determination distributed as generally and as evenly as the opportunities and willingness of members to do the work would make practicable. However learned, able and useful your Permanent Commission may be, the welfare of the Society, and the interest of members in its labors, would not be advanced by making or allowing such a standing committee to become the absorbent or receptacle of all scientific questions arising here. It ought not to be made, or allowed, to supersede the business and duties of special committees, and thus make the other active members of the Society feel that they have nothing to do, and can be of no aid or use in our investigations. It might be difficult to draw any accurate line of demarcation between it and other committees, but I would suggest, in general terms, that any question arising in a meeting of the Society by motion, resolution, or vote of inquiry, might very well be referred to a special committee to be appointed for that purpose, while any questions arising by correspondence, inquiry, or reference, from other sources, and referring not to routine business, nor to the interests of this Society, as such, but to a purely scientific or medico-legal question, and arising in the interim of our meetings, might be laid before the Permanent Commission in the manner provided for in its organization; and such, I understand, was the object and aim of its distinguished prototype, the Permanent Commission of the Medico-Legal Society of Paris.

I submit that some more definite plan should be adopted, if at all practicable, for the publication in permanent form of our papers and transactions. The present mode of publication in the organ of this Society is good and useful so far as it goes. Do we not need and merit more than this? Other scientific societies and associations publish their transactions in a form more convenient for use and reference, and more sure and easy of permanent preservation. The second volume of our papers and transactions remains unpublished, while material for a third volume has in great part accumulated. This is, upon every account, to be regretted, and it is to be hoped that in this respect we may not longer continue to lag behind sister societies. And whether our papers and transactions are to be published in volumes or not, I submit for your consideration whether an arrangement cannot be made, within the means of the Society, or by the co-operation of authors and the publishers of THE SANITARIAN, to have our papers printed and distributed in pamphlet form. By this means a copy of every paper could be placed, soon after being read here, in the hands of any member of the Society; many would read who cannot always be here to listen. A more lively interest would be kept up in our proceedings and discussions, and this publication, either in book or pamphlet form, would often enable us to make exchanges with other Societies in this and foreign countries, and thus be making valuable additions to our library.

To increase and preserve, to render complete, and therefore great and useful, the library of this Society, ought to be among our most cherished aims and purposes. Libraries are the centres and foci into which the world's thought is condensed, in whose folds truth finds permanent lodgment, surrounded by an army of witnesses. Libraries are the luminaries from which radiate the beams and floods

of light to guide and strengthen the race in its search after undiscovered facts, while assuring the mental grasp upon the harvest already gathered. We have made a good beginning with our library. Time, labor and money have been expended upon it. It is already a good collection—one of the best of the kind on this continent. But it is not complete. It can be made fuller and better. The desirableness of doing this is not open for discussion. But plans and means need to be devised and executed. The plan of soliciting and securing contributions of books and pamphlets has been so fruitful and successful in the past, that we may still hope to rely in part upon that mode of increase in the future. But while employing this means to increase and build up our library, some care must be exercised to prevent the accumulation of a uselessly large number of copies, especially old editions, of the same work, and to prevent lumbering our shelves with donations of books, very good of their kind, but wholly foreign to our subjects of inquiry and discussion. The other plan, that of direct purchase of books with our own funds, or with donations of money made by others for that purpose, has the advantage that we may thus make sure of the latest editions, and make such selections as demands for books by members, and discovered deficiencies, indicate to be necessary. By this means a library grows, not merely in size and numbers, but also in completeness, in unity and efficiency.

Touching two of the subjects to which I have called your attention, and upon which I would recommend your action—I mean publishing our papers and transactions, and increasing our library—I am aware that expense is the great difficulty which meets us at the threshold. While I am not prepared actually to recommend that our revenues be increased by an increase of our annual dues, yet I do venture to submit for your consideration whether such a measure would be wise and practicable. If it could be done without injury to the Society, then certainly our increased ability to print and to buy, would lend an increased interest to the Society in the eyes of all, both members and the public at large.

Again thanking you for the honor you have conferred upon me, and doubting my ability and opportunity to serve you as others might, I am yet sure that no member of this Society entertains a more ardent wish than myself for your success, your prosperity, your renown, and your continued and increased usefulness.

On the conclusion of the Inaugural Address, Clark Bell, Esq., Jacob F. Miller, Esq., and J. C. Peters, M.D., were appointed a committee to report upon the recommendations of the President.

Mr. Clark Bell was invited by the Society to prepare for the Society an account of his recent visit to London and Paris, and to leading scientists in those cities, which he promised in time for the January meeting.

SHALL NOT THE OPERATING THEATRES OF HOSPITALS BE ABOLISHED?

By Stephen Smith, M.D., Surgeon to Bellevue Hospital, New York.

An operating theatre is regarded as an essential feature in every hospital. Its ostensible purposes are twofold: 1st, to furnish in an available place all needed facilities for operations, such as a suitable table, good light, all necessary instruments and appliances, and, 2d, to give students and others an opportunity to witness the operations. It is, therefore, always centrally located, generally on an upper floor, and is arranged with circular seats, in the form of an amphitheatre. It is a very convenient room for religious and other meetings, and many times in the week is occupied by a promiscuous assemblage of people. An examination of a large number of operating-rooms of hospitals, proved that they had no adequate means of ventilation, that they were so located as to be the recipients of waste air from other parts of the hospital, and, finally, that they were befouled with the filth of tobacco, street dirt, etc. In general, the theatre is never adequately cleaned, certainly never adequately disinfected and ventilated.

It is in an atmosphere thus heavily charged with septic ferments that the surgeon lays open the fresh wound of the patient, rich in all the elements of putrefaction. He is surrounded by an eager crowd, whose breath and clothes are saturated with viable germs of every form of organic life.

The results of such operations often prove unexpectedly disastrous; profuse suppuration is established in an enfeebled system, and fatal blood-poisoning is too often the sequel. There can be no doubt in the mind of any conscientious surgeon, that the operation often initiates a new and fatal disease.

If we inquire what has been gained by this peril of the sick, the answer must be, *Nothing*. The operation has not been performed any better, probably not as well as it would have been in private. The bystanders have learned absolutely nothing that will be of any value. Nothing is more absurd than a gathering of medical students seated in an operating theatre, and straining their necks to see an operation at a distance, and thus qualify themselves to be operators.

But, it may be asked, How, then, is operative surgery to be learned? We answer, On the subject. Anæsthesia and the elastic bandage have reduced the larger number of operations to the conditions which obtain in operations on the cadaver. Absence of pain and blood are now the rule. Every student should have a thorough course of operative surgery on the subject, and pursue his further studies as a surgeon's assistant. To the inquiry, What should be the provision for operations in a hospital? we answer, The operating-room should be constructed and managed for the sole purpose of making operations successful methods of treating surgical affections. This implies that the air is free from all dangerous impurities. To secure pure air in

any room requires, 1st. That such room shall be so located that it receives no impure air from without; this would require that it should have no direct communication with any other room where foul air exists or is generated, as a ward. It should be located on a first floor, and isolated from all other rooms or buildings, so far as direct air-connection is concerned. 2d. That foul air should not be generated within the room in dangerous quantities. This condition would require that the room should accommodate but few persons. The number ought to be limited to the surgeon and his assistants. It would exclude all furniture except the table and wooden stools for the operator and his attendants, and a plain case containing the instruments. 3d. That the air and walls be thoroughly disinfected after each operation. This would require a small room, without dead corners, with walls which could be treated with disinfectants. The room might be circular or oval, and have walls of materials that could be lime-washed, or washed with strong solutions of carbolic acid. During the interval of an operation its interior should be exposed to sunlight, and constant currents of pure, fresh air.

It may seem a needless refinement to exact such conditions in operative surgery, and most surgeons fond of displaying their dexterity to a crowd of admiring and applauding students would suffer no such curtailment of their vanity. But, on the other hand, we hear the warning voices of men like Gross, Lister, Erichsen, Volkman and Guèrin, teaching us the solemn responsibility which rests upon every surgeon who makes a fresh wound. Any wound, however slight, these great teachers allege, may prove fatal by being poisoned at the operation. The extreme danger of making fresh wounds in the air of the ordinary operating theatres of hospitals is strikingly illustrated by some recent experiments of Prof. Tyndall. This exact experimenter was endeavoring to carry on a series of demonstrations which would be vitiated by septic matters in the atmosphere. His experiments were in the building where he usually lectured and experimented. In spite of the most vigilant attention to all of the details, and the greatest care in excluding ferments from his solutions, he continually failed in his results. A friend suggested that he should remove his apparatus to a new building in an airy situation. He complied, and at once succeeded in all of his experiments.

The fresh wound in the flesh of the ordinary hospital patient is scarcely, perhaps, not less susceptible to the septic ferments of the air than the solutions of the physiologist.

We have, fortunately, in atomized disinfectants, the means of destroying the septic poisons in the air around the wound and on the instruments employed; but it may be truthfully urged that the necessity of employing such an agent proves the unfitness of the place for the operation. But more important is the fact, that few surgeons who operate publicly will be found willing to obscure their manual dexterity by the materials and manipulations necessary to successfully apply disinfectants.

The following propositions are submitted:

1st. The ordinary operating theatre of hospitals should be abolished, as dangerous to the patient, and useless for the purposes of instruction in operative surgery.

2d. The operating-room should be conveniently located on a first floor, and be so isolated as to be completely protected from all sources of foul air, and so constructed as to be capable of being thoroughly disinfected after each operation, and exposed, during the interval, to sunlight and currents of fresh air.

3d. All operations should be private, with no persons present but the operator and his assistants, and, in general, the air should be disinfected during the operation.

The Climate of Florida is one of the finest in the world; though ten degrees nearer the equator than Southern Italy, the temperature is no warmer, and the air far more equable and dry.

The annual mean of meteorological observations made at Jacksonville, by the chief signal officer of the United States, is: Barometer, 30.101; thermometer, 69° .6; rainfall, 53.95; prevailing wind, northeast.

The average mean temperature of the State is 73° F., and the difference between summer and winter does not generally exceed 20°, while at Key West it is not more than 11°. On the average the winters are thirty or forty degrees warmer than in New York, while the summer months of the latter are ten or fifteen degrees hotter than in Florida. . . .

Owing to the evenness and salubrity of its climate, Florida has long been a popular resort for invalids, and especially those afflicted with pulmonary complaints. Of the total deaths from all causes in Florida, in 1870, as reported by the Federal census, only 131 were from consumption. There were 17.3 deaths from other causes to one from consumption. . . .

The rivers of Florida are numerous, and many of these waters are extremely picturesque in their unique beauty of wild and rank tropical vegetation, presenting everywhere to the eye of the stranger very novel attractions, in the profusion and variety of the trees and shrubs and vines which line all their shores and bayous.

The St. John's, it is said, with its navigable branches, affords one thousand miles of water transportation, and it is credited with carrying a larger body of water than the Rio Grande. Its banks are lined with a luxuriant tropical vegetation, handsome shade trees and orange groves, and here and there picturesque villages. For its whole length of four hundred miles the river affords glimpses of perfect beauty. One ceases to regret hills and mountains, and can hardly imagine ever having thought them necessary, so much do these visions surpass them. It is not grandeur which one finds on the banks of the great stream—it is Nature run riot. The very irregularity is delightful, the decay is charming, the solitude is picturesque.—*Appleton's Hand-book of Winter Resorts.*

To reach Florida and all points South and Southwest: via New York and Savannah steamship lines, George Yonge, agent, 409 Broadway. Atlantic Coast Line of Railways and Connections—New York office, 229 Broadway.

Editor's Table.

School Discipline in New York.—We remember reading somewhere an anecdote of a school-master, who one day, while busily engaged in his "noisy mansion," was honored with a visit from the king. Instead of treating his royal visitor with the profound reverence always expected from a loving subject, he continued, without embarrassment, the regular duties of the hour, extending to His Majesty the politeness and courtesy due an ordinary visitor, and nothing more. But when the king took his leave, the pedagogue followed him into the vestibule, and then throwing himself on his knees, begged his sovereign's pardon for his apparent want of loyalty, adding by way of apology, "Did I allow my boys to know that there lives in the kingdom a greater man than myself, I should not be able to govern them another day."

We are reminded of this story by some recent actions of the Board of Education, which occasionally puts on an appearance of waking up to its duty; for among the current events of the season we have an instance of that illustrious body fining a lady principal for boxing the ears of an unruly boy. Now, without discussing the justice of this action, we must be allowed to express the opinion that the publicity given to it is both unfair to the lady, and detrimental to good school government; for if circumstances ever require an executive session of any Commission, it is when dealing with those whose duty it is to exact obedience from others. Perhaps those gentlemen little thought that in taking this action thus publicly, they were dealing a blow at school discipline, recovery from which may require months, or even years; for it is well known that such action is long remembered by fractious children and clamorous parents, and always to the detriment of wholesome order and discipline. If the Commissioners imagine themselves wiser than Solomon, their subordinates must gracefully accept the situation, and do the best they can under the circumstances; and if a teacher, even though provoked beyond endurance, so far forgets herself as to transgress the laws by which she is governed, neither she nor her friends can complain of the penalty, whatever it may be. Still we insist that this action of the Board would have better served the cause of Education had it been taken privately, rather than with that publicity which gives to every little urchin capable of reading the newspapers, an opportunity of shaking his fist in the face of his teacher, with the challenge, "Strike me if you dare."

In connection with this action, according to reports as published in e of the daily papers, there was a good deal of criticism expended

upon some other features connected with the general discipline of the school. If we remember correctly, this is the school which, for many years past, has been regarded as one of the best, if not the best school of its grade in the city. It is the school to which Commissioners have delighted to introduce distinguished visitors, to witness the ease and precision with which the pupils went through their daily exercises, and the thorough knowledge acquired of the branches in which they were taught. Its public receptions have elicited fine speeches alike from Commissioner and visitor, as well as complimentary notices from the press; notwithstanding, at this late day, the Board of Education, in one of its virtuous spasms, finds out that it is all wrong. We do not wish to be understood as either approving or condemning the discipline of any particular school; but we would really like to know why the Commissioners could not have discovered and corrected any undue severity in discipline before their attention was called to the subject by the "Society for the Prevention of Cruelty to Children."

But while this excellent Society has its hand in, we are constrained to inquire of it: Why this straining at a gnat and swallowing a camel? Can it be possible that the Society for the Prevention of Cruelty to Children has never heard of the school-room poisoning in New York? How the children are deprived of fresh air, how they are subjected to the foul odors and poisonous gases emanating from badly situated and imperfectly constructed privy vaults? Nor heard anything of the propagation of fatal epidemics of diphtheria, scarlet fever and measles, through the cruel negligence of the Commissioners? Or is it all a difference between tweedle-dum and tweedle-dee? The Commissioners may cruelly smother children by criminal negligence; but the teachers are not only required to submit to this in silence, but held responsible for the discipline in their schools, while they are deprived of the means of maintaining it.

It appears to us if the discipline, after having been practiced for so many years, was sufficiently severe to deserve this public rebuke, it was the duty of the Commissioners to have it corrected, instead of encouraging it with their presence and their fine speeches; and, furthermore, if the general discipline or supervision of any school has been such as to be in any degree injurious to the health of the pupils, the Board of Education has neglected an important duty.

As a remedy for habitual neglect in this regard, it would, doubtless, be a permanent benefit to the public schools of New York if the Commissioners would fine themselves each fifteen days' suspension, and then resign in favor of persons capable of discerning and discharging their duties without the aid of philanthropic or charitable societies. "*Quis custodiet ipsos custodes.*"

The Training School for Nurses, in New York, gives promise of being one of the most useful appendages connected with the Department of Public Charities. It is the outcome of a movement on the part of a society of benevolent ladies a few years ago, who organized a plan for the education of nurses under the auspices of Bellevue Hospital. In the spring of 1875, Hon. Wm. H. Wickham, then Mayor of the city, invited a conference of the ladies of the State Charities Aid Association, several prominent physicians, and the Commissioners of Public Charities and Correction, to discuss the propriety of establishing a Training School for Nurses. This conference resulted in the establishment of such a school at Charity Hospital. The school began the following August, with twenty pupils, which number was soon after increased and limited to forty. The terms were: the pupils were to receive ten dollars a month for the first year, and fifteen for the second, together with board, washing, etc. Upon passing a successful examination, at the end of two years, they were to receive diplomas to the effect that they were competent nurses. The first result of the establishment of this school was the sudden and radical change in the hospital. The pupils were of a class better than it was at first thought possible to secure, many of them being ladies of culture and refinement, who, from the first, commanded the respect of all the officials, and at once swept away abuses which had existed from the foundation of the hospital; and the care and sympathy which they bestowed upon the patients not only promoted their recovery, but gave an improved and new moral tone to the institution. The death-rate of the hospital has steadily diminished ever since. The instruction of the nurses has been comprehensive and thorough, consisting of lectures by the physicians of the hospital, constant drill by the bedside, and frequent examinations by the Chief of Staff. While they have thus been made familiar with the action of drugs, and taught to meet emergencies and act intelligently in the care of the sick, care has been taken to impress upon them that the treatment of disease is the province of the physician; while the work of the nurse is to faithfully and conscientiously carry out the treatment indicated.

The number of graduates is sixteen. How well they have availed themselves of their advantages is abundantly shown by the Commencement Exercises of the *First Annual Report:* comprehending essays on the General Care of the Sick; Hygiene; Nursing of Children; Nursing of the Eye; Medicines, their Action and Uses; Ventilation; Ophthalmic Nursing; Blackwell's Island, and a Valedictory, which do credit to the highest standard of current medical literature.

To secure their addresses for employment, inquiry should be made at the office of the Commissioners, 66 Third Avenue; or of the Chief of Staff, Charity Hospital.

Death-rates per 1,000 inhabitants, annually, from all causes and certain special causes.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Deaths under 5 years.	Total No. of Deaths from all Causes.	Per 1,000.	By Violence.	Small-Pox.	Diphtheria.	Scarlatina.	Measles.	Croup.	Whooping-Cough.	Typhoid Fever.	Typhus Fever.	Puerperal Diseases.	Diarrhœal Diseases.	Consumption.	Lung Diseases other than Consumption.
New York, 1,079,326—2 wks. end'g Nov. 10	378	901	21.7	37		51	22	1	29	12	19		8	49	151	172
Philadelphia, 856,900—4 wks. end'g Nov. 24	339	1005	16.06	25		44	22		33	33	31		3	10	174	103
Brooklyn, 528,000—4 wks. end'g Nov. 24...	322	769	18.9	28		70	41		32	4	6	1	10	20	141	72
St. Louis, 500,000—4 wks. end'g Nov. 24...	135	361	9.38	14		19	1		18	4	12			10	59	25
Chicago, 460,000—4 wks. end'g Nov. 24.....	234	488	13.79	19	3	44	34	2	27	32	1		5	10	43	43
Baltimore, 350,000—4 wks. end'g Nov. 24...	194	431	16.	14		58	19	1	21	8	18	1	2	5	79	37
Boston, 363,000—4 wks. end'g Nov. 24.....	171	501	17.94	18		33	6		15	5	18			15	100	56
Cincinnati, 280,000—4 wks. end'g Nov. 24..	124	326	15.13	17		24	7		10	7	13		6	21	65	27
San Francisco, 300,000—month of Oct.....	175	433	17.32	32		41			7	4	22		1	41	44	29
New Orleans, 210,000—2 wks. end'g Nov. 11	75	202	25.	14	3						3			23	27	15
Washington, 160,000.....																
Pittsburgh, 145,000—month of Nov.....	119	261	23.40	19	29	73	10		1		9		1	4	20	21
Newark, 126,000.....																
Providence, 103,000—month of Nov.....	64	175	20.04	4		37	4		8		8			5	28	12
Milwaukee, 123,000.....																
Rochester, 70,000																
Richmond, 75,000—4 wks. end'g Nov. 24...	48	115	19.93	3		6	4		2		6			3	21	9
New Haven, 60,000—month of Nov	35	97	19.4	6		13	8		10	1	1		1		12	3
Charleston, 57,000—2 wks. end'g Dec. 1....	25	57	26.													
Toledo, 50,000.....																
Mobile, 40,000—month of Oct.....	25	86	25.8	6		3			1		1			9	16	6
Dayton, 36,000—month of Nov.....	10	33	11.	1			2				2		4		10	
Nashville, 27,000—month of Nov.....	10	54	24.	3		11	1		1					2	5	1
Wheeling, 28,000.....																
Buffalo, 170,000—2 mos. end'g Nov. 30.....	111	312	11.01	18		5			3	6	18			19	49	20
Knoxville, 13,000—month of Nov.....	1	14	12.67	1											5	1
Paterson, 40,000—2 mos. end'g Nov. 30....	82	170	25.5	2		49	5		6				3	6	28	15
Petersburg, 20,000—month of Oct.....	10	43	25.8	3						1				4	3	2
Selma, 8,000—month of Nov.....	12	17	25.5					2							2	
Elmira, 20,090—month of Nov.....	8	18	10.75	1		4								1	3	1
Yonkers, 18,000—month of Nov.....	4	26	17.33								1		1	1	2	9
Memphis, 45,000.....																
Detroit, 115,000.....																
Syracuse, 60,000																
Reading, 40,000.....																
Sacramento, 21,000—month of Oct.....	11	43	24.56													
Minneapolis, 44,000—month of Oct.....	21	85	9.54	1		1	1		3					3	5	4

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Correspondents under this head are earnestly requested to send their reports promptly, and latest estimated population.

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Foreign.—United Kingdom of Great Britain, during four weeks ending Oct. 20th, 23,090 births, and 12,862 deaths, were registered in London and twenty-two other large towns, and the natural increase of the population was 10,236. The mortality from all causes was, per 1,000, in London, 19; Edinburgh, 19.75; Glasgow, 21; Dublin, 25; Portsmouth, 15.50; Norwich, 19.25; Wolverhampton, 27.50; Sunderland, 20.25; Sheffield, 16.75; Birmingham, 22; Bristol, 20.75; Liverpool, 26; Salford, 26.25; Oldham, 20.75; Bradford, 20; Leeds, 20; Hull, 21.50; Newcastle-upon-Tyne, 20.25; Leicester, 20.75; Manchester, 26; Nottingham, 21.25. Other foreign cities at most recent dates, per 1,000—Paris, 23; Rome, 20; Vienna, 22; Brussels, 22; Berlin, 27; Hamburg, 26; Calcutta, 31; Bombay, 55; Madras, 117; Amsterdam, 21; Rotterdam, 22; The Hague, 19; Christiana, 20; Breslau, 27; Buda-Pesth, 36; Turin, 22; Alexandria, 51; Copenhagen, 19; Munich, 28; Naples, 22.

Subscribers will greatly oblige us by promptly remitting subscriptions for VOLUME VI, of which this is the first number, and so save us the labor and expense of sending bills. Send postal order or check: THE SANITARIAN, New York, P. O. Box 1956.

New York: Preventable Diseases and their Costs.—Professor CHANDLER, President of Board of Health, in addressing the Board of Apportionment, on the 14th ultimo, said:

10,000 preventable deaths take place in the city of New York annually, while we had 280,000 preventable cases of disease during the same period. Thousands of lives were thus needlessly sacrificed.

The amount of $232,042 was absolutely necessary to carry on the work of the Health Department for 1878. The hospital for contagious diseases cost about $30,000 per year, while the work of vaccination cost some $20,000. Since 1874 250,000 persons had been vaccinated. So effectual had been this treatment, that only thirteen deaths had resulted from small-pox during the past year. An epidemic of small-pox in this city would cost several millions. In Philadelphia it had necessitated an expenditure of $16,000,000. Doctor Chandler further contended that the health department could well use $100,000 more than the sum called for in the provisional estimates. This money would come back tenfold to the inhabitants of New York. It would pay to have every house in the city thoroughly examined as to its sanitary condition by competent inspectors. The department wanted more inspectors, particularly for the examination of milk. Over $10,000 per day was spent in the metropolis for an inferior quality of milk. Hundreds of children were in consequence rendered weak and puny. The money contributed to the Health Department would be well spent, if applied alone in the prevention of this fraud of selling impure milk. The Health Commissioners had only one milk inspector for a city sixteen miles long, and with a population of over one million souls. More meat inspectors and engineers for the examination of buildings were also required. The sum of $5,000 was spent last summer during the hottest month in the employment of fifty physicians. These gentlemen had visited 131,573 families and treated 5,000 children during that short period. All know of the terrible mortality that existed among children during the heated term. Many lives were saved by the advice and attention of these physicians. Bad food, dirty streets, improper sewerage, insufficient exercise and want of ventilation were the causes of this mortality.

Dangerous Advice About Cellars.—"Defective Drainage of Dwelling Houses" is the title of an illustrated pamphlet by Sanitary Inspectors C. P. Russel, M.D., W. H. B. Post, M.D., and T. J. Nealis, Sanitary Engineer, approved by the Sanitary Committee, and recently issued by the Health Dapartment, New York, as a special document for the instruction of the people on the common defects of house drainage and bad plumbing, and how to remedy them. We regret to find in this otherwise instructive and useful pamphlet the following dangerous statement: "A persistently wet cellar should be provided with a separate blind drain *emptying into the trap of the house sewer.*" Surely nothing could be better calculated to add to the dangers of soil-moisture the poison of sewer gas, than such a remedy. And we can conceive of no "circumstances" of soil-moisture alone, which "will permit" of such a remedy, which will not permit of a better; or which had not, indeed, better be endured alone, than to be coupled with the additional danger of open cellar communication with the main sewer, by means of such an inefficient, untrustworthy and dangerous connection as the house-sewer trap.

Brooklyn.—While the Health Department has recently shown energetic efforts for the suppression of zymotic diseases, by requiring reports from physicians in attendance on them, isolating them as far as practicable, and causing he premis es to be cleaned and disinfected, as necessary means for their suppression and the maintenance of the public health, Dr. John G. Johnson, a physician of distinction and extensive practice, has publicly avowed himself in antagonism to all requirements of in-

formation from physicians by the Health Department, as a trespass upon private rights—holding, in effect, that any individual not only has the right to have small-pox or typhoid fever, but to maintain it at his neighbor's door. Moreover, he holds: "Every physician who has reported to the Board of Health a case of contagious disease, without his patient's consent, becomes liable to punishment, . . . thirty days in the common jail and $250 fine." And for this he goes into the formality of citing various heterogeneous, but long since obsolete, laws, taking no cognizance whatever of numerous enactments since he was born, and particularly since the establishment of the Metropolitan Sanitary District, in 1866, and the State law of 1873, conferring all its powers on the municipality of Brooklyn. The few exceptional cases which he cites of Common Council acts, which seem to give color to his assumption, were in default of a legally constituted Board of Health, and bear no relation whatever to the enactments which he is ambitious to put to the test. He is, doubtless, conscientious, however, and as he has a following in his extraordinary course, we are glad to have reason to think the Health Department will gratify his wish for prosecution.

San Francisco and Her Mudsills.—By the Annual Report of Health Officer for the City and County of San Francisco, for fiscal year ending June 30th, 1877, the city has an estimated population of 300,000—an increase of 27,655 over preceding year. Deaths for the year 6,170, an increase of 1,379 over the year 1876; accounted for by the unusual prevalence of small-pox and diphtheria. From these two diseases alone there were 1,358 deaths—446 from small-pox and 912 from diphtheria. Death-rate per 1,000, 20.56, against 17.6 the preceding year. Deaths from zymotic diseases, 2,148—34.8 per cent. of the total mortality.

The Health Officer very justly considers so large a proportion of deaths from preventable disease a sad commentary on the condition of the city. Defective sewerage and bad house-drainage, and the Chinese, he considers chief causes, demanding the earnest attention of the Legislature and the municipal authority. Against the domestic habits of the Chinese, particularly, plenary powers for the health authorities are urged as the only possible means of preventing filth diseases and contagious epidemics. The cause and suddenness of the outbreak of the epidemic of small-pox the Health Officer declares was due to the presence of the 30,000 Chinese in their midst. It seems the Chinese are not only in the habit of concealing contagious diseases, but the dead bodies of those who die of them, thus rendering it exceedingly difficult, in many cases, to find and disinfect the prime sources. The Health Officer regards them as "a social, moral and political curse to the community," just as, we suppose, the "mudsills" of other communities are; and, probably, only equally defiant of everything that is decent—socially, morally and politically—and equally subject to small-pox.

A reference to the records of THE SANITARIAN for the last year, will show that New Orleans, Milwaukee, Pittsburgh, Philadephia, Nashville, and several other cities—not overburdened with the Chinese—have, nowithstanding, had epidemics of small-pox, which is no respecter of persons *who have not been vaccinated*, no matter what their race or nationality; and so long as this is the case, we shall continue, with the Health Officer of San Francisco—practically—to urge the universal practice of vaccination as the only efficient means of preventing its spread, even from and among the Chinese.

"The record of births" is so incomplete as to be of no statistical value. Marriages are not mentioned.

The city prisons are worthy the nabob of Calcutta; cells which measure a cubic capacity of only four hundred and eighty-six cubic feet, and some of them entirely

excluded from the sun's rays, are made to accommodate, at times, four or five prisoners each.

Of female prisoners the city physician reports: "Children, the offspring of unfortunate and dissipated parents, are allowed to accompany their mothers to prison. . . . It cannot be expected that children from four to ten years of age, confined with their mothers in a prison where the very worst language is used, can ever become good citizens." We are not informed whether this system of criminal education and suffocation of prisoners was instituted by the Chinese or contracted from their vicious habits. But the Health Officer states that "no fault can be attached to the sheriff or any of his officers for this state of affairs, as the law compels him to confine all persons legally committed to his custody, without making any provision for their comfort other than that of sharing a portion of the overcrowded cell." A condition of things, to say the least, in perfect harmony with the abhorrent habits of the Chinese, and equally incensistent with and unworthy the tolerance of an enlightened community.

Jennings' sanitary inventions are worthy of the attention of all householders and trustees of public institutions. Among his most recent improvements is a new **Trapless Water-closet,** free from complicated mechanism, and, consequently, not easily liable to get out of order. The valve is operated by a float acting automatically, which keeps the closet always supplied with water, while a solid plunger, fitting air-tight, virtually estops the rising of sewer gas. A trap may be attached, if desired; but if a ventilator is used, as it always should be—with every kind of closet—no trap is necessary. It, together with a large variety of other sanitary appliances, may be seen at the depot of the American Agency, 94 Beekman Street.

Phillips' Palatable Cod-Liver Oil or Phospho-Nutritine, advertised in this number, is an elegant emulsion of Cod-Liver Oil with the Phosphates of Potash and Magnesia. It is miscible to any degree with water, and so flavored with aromatics as to be agreeable to the taste, and acceptable to the most delicate stomach, child or adult. It is adapted to all conditions in which cod-liver oil and the phosphates are indicated, and well calculated to promote their usefulness.

Literature.

"How we Raised Our Baby"* is a practical story on baby sanitation, which all parents may read with benefit, and which should be circulated as a free tract among the trustees and patrons of nurseries everywhere. The author of "Helen's Babies," who has written an introduction to it, says it is "infinitely more valuable to those who are interested in children" than his little books, which have delighted thousands of readers. This commendation we endorse—doubtless for the same reason which gave it utterance, because "Our Baby" is an earnest plea for the lives of the babies of thousands of Helens all over the land. "A Benedict" is doubtless a physician of extended observation of the difficulties and dangers which surround babies even under the most favorable circumstances; and, under such significant titles as "The Arrival of the Baby"; "The Doctor"; "The Mothers-in-law"; "A Multitude of Counsellors"; "Wanted—A Wet Nurse"; "The Nursery," etc., etc., unsparingly lays bare the crimes of omission and commission connected therewith, in a manner *painfully* attractive, because it cannot be otherwise, but so much the more necessary to all parents and nursery trustees.

The concluding chapter is a carefully condensed summary of observations and rules necessary to the maintenance of a

*By a Benedict, with an introduction by the author of "Helen's Babies." New York: Derby Brothers.

healthful nursery and healthy babies, which all mothers and nurses would do well to commit to memory.

Absorbed in the importance of his theme, the author has given but little play to fancy, and in some instances forgotten his rhetoric. While the publisher has evidently undervalued the material at hand—of which both paper and type are unworthy. But we opine an early opportunity for the removal of these blemishes, by the demand for a new edition of the best book on the nursery hitherto published.

The Sanitary Condition of Portland* is a deservedly trenchant exposure of a fair example of the criminal conceit which obtains among a large proportion of the municipal authorities of the United States. Portland's Board of Health, like those of hundreds of other American cities, consists of the Mayor and Aldermen, or a committee of that body, with the City Clerk for Registrar of Vital Statistics.

In Portland, "the deaths are recorded in the following manner: When a person dies, the undertaker who provides the coffin is required by law to fill out a blank, in which are spaces for 'date of death, place of death, full name, full name of parent, full name of husband, disease, age, when buried, where buried,' and some details as to the exact location of the grave. The information on most of these points is presumably supplied by the family of the deceased. What they do not know or have not furnished is guessed at, and the report is delivered to the 'Superintendent of Burials,' who records the statements in a book kept for that purpose. The imperfections of this method are as numerous as possible. In the first place, it is very certain that all the deaths are not recorded."

As an illustration of the record: "Opening entirely at random a volume of entries not ten years old, the column headed 'Disease,' showed thirty-seven items, and more than half that number of orthographic blunders, of which the following are a few specimens: Hart desies, applex, warme fever, softning braine, parlyese, inflemtun bluder, pneumonear, . . . theeting, megsles, mezels, colery infantm, whoping coff, sclaret fever, calert rash, diheaters, coroneck direa, . . . knrrin evil, . . . ulster one the stumick,' etc.

"But when a public officer of this city records a death from 'Old Age' at 'three months,' and writes 'still born' opposite the name of a person who has attained to the ripeness of 'seventy-four years,' it may not unreasonably be claimed that he has committed an offense which no man's understanding can condone." Negligence in regard to the purity of the water supply, systemless drainage and sewerage, are in keeping with the registration of vital statistics, all going to show a careless tolerance of the general causes of unhealthfulness, and heedlessness of results disgraceful to any community claiming to be enlightened.

Analyzing the record of such nonsense to the best of his ability, with the *prima facie* evidence "that all the deaths are not recorded," Dr. Gerrish estimates the number of deaths for 1876 at 674, of which number 228 were under five years of age. 178, or 26.42 per cent., were caused by infectious diseases. Consumption killed 155.

Estimating the population at 35,031, the ratio per 1,000 was 19.24. Assuming 17 per 1,000 as the highest ratio, which might be deemed tolerable for Portland (but it should certainly not be above 12), Dr. Gerrish finds the authorities guilty of sacrificing 78 lives, at least, which ought to have been saved. Estimating the value of these 78 lives, and the loss sustained by the cost of their sickness and premature death, he shows that the pecuniary loss to the City of Portland,

*A Report presented to the Main Association, June 14th, 1877, by Frederic Henry Gerrish, M.D., Professor of Therapeutics and Lecturer on Public Health in the Medical School of Maine, etc. Portland: Stephen Berry, Printer.

in default of an intelligent Board of Health, was, for the year, about $500,000.

He concludes his paper with some valuable suggestions to the city authorities, and urges upon his fellows of the Main Association efforts for the establishment of a State Board of Health.

The Treatment of Diphtheria with alcohol will, according to the author of a pamphlet before us,* deprive that fatal disease of "ninety-five *per centum* of its victims." Aye, more—"In fact, it is as much a specific for the diphtheritic poison as quinia for the malarial; each breaking up a special morbid process, and rendering a prompt return to health possible, through an unknown potency that has as yet defied the search of science. So, also, the analogy holds as to the prophylactic qualities of these two remedies; *what is curative being equally preventive in each instance.*" The *italics* are ours. The author himself, whose sincerity no one will question who knows him, is apparently so much astonished at these extraordinary results, that he ventures to account for them by that singularly accommodating quality of alcohol which is claimed for it by all who like it, in sickness or in health.

"Under ordinary conditions," he remarks, "alcohol is a stimulant; but in diphtheria it lacks this property, a quantity which would in health induce intoxication having no excitant effect; it is thrown off in the breath; but in diphtheria, unless the dose is disproportionately large, no odor is perceptible until the disease begins to yield; it is contra-indicated in acute attacks of fever, especially if attended with local inflammation; but in diphtheria the contrary holds true: it is demanded, when the vascular excitement lessens and nervous energy flags, to support the vital forces in the effort to rally from the shock and regain their supremacy; but in diphtheria the poison has, at this stage of the disease, done its work so thoroughly, that alcohol no longer, or but feebly, manifests its antidotal property."

Notwithstanding, on the accepted etiology of diphtheria, common knowledge of the conditions under which it is most extensively prevalent, and considerable personal observation, we are constrained to believe the author of this pamphlet is mistaken; that the results which he gives, however inexplicable on any other hypothesis, are not due to the use of alcohol, and that alcohol is not a prophylactic of diphtheria; otherwise we should be led to inquire—in virtue of such experience—how it ever came to pass that diphtheria should exist at all? If alcohol is a prophylactic against sewer gas poisoning in diphtheria, it should be equally so in other filth diseases. Whereas, on the contrary, its use is so common to persons living under conditions in which diphtheria and other filth diseases are most wont to prevail, we cannot avoid the conclusion that instead of being a prophylactic and remedy against sewer gas poison, or the diseases caused by it, alcohol is a congener, calculated to intensify the poison and promote its effects; and no benefit can be ascribed to it on other grounds than *similia similibus curantur.*

Winter Resorts, about which we have many inquiries, are so admirably summarized and described in Appleton's Hand Book,* that we can do no better than to recommend it to all who seek them for either health or pleasure. Indeed, the book is designed for both invalids and tourists, and we know of no work which gives so much information on the subject in so small compass; yet it gives all the important facts necessary to enable physicians to advise, and intelligent, healthy people to choose, such resorts as are best calculated—in any given case—for either health or pleasure.

* By E. N. Chapman, A.M., M.D., late Professor of Obstetrics, etc., Long Island College Hospital. Reprint from Buffalo *Medical and Surgical Journal.* Buffalo, N. Y.: Bar Jones & Co.

* Appleton's Hand-Book of Winter Resorts, with Principal Routes of Travel. Price 50 cts. D. Appleton & Co., New York.

It comprehends the physical aspect, climatology and productions of the soil; gives full data from the most reliable sources in regard to temperature, rainfall and healthfulness, as measured by statistics of disease and mortality; numerous general and topographical maps, illustrations of interesting objects and scenery, the routes and facilities of travel, hotel accommodations, and useful hints to travelers and sojourners.

Changes in New England Population, by Nathan Allen, M.D., LL.D.,* is a statistical paper of much practical value to future generations, if they will profit by the lessons herein taught. The changes discussed are: residence, pursuits, numbers, character, causes and effects. The author takes up the people collectively in their primitive relation to their habitat, and follows them from parent to offspring, pointing out, by the way, the influence of the conditions suggested by the titles which head the several sections, and deduces the conclusion that, "The birth-rate of New Englanders has, for a long time, been gradually declining, approaching nearer and nearer to the death-rate, so that their increase from this source has become, as a whole, small, and in some localities doubtful; whereas it is an established fact that the birth-rate of the foreign element is twice that of the American, so that the probabilities are that the former class will steadily gain in numbers upon the latter." The causes of this decline are summed up in general terms, comprehending many thoughtful suggestions.

Retarded Dilatation of the Os Uteri in Labor† is the title of an instructive pamphlet on a subject of much practical importance to all medical practitioners.

Moral Insanity* is a brief contribution to the literature of a much-vexed question. The gist of the paper is an argument in favor of a moral sense totally independent of intellectual action, and as this sense, the author argues, is like the other senses—of touch, sight, hearing, etc.—it is liable to disease, or sometimes subject to inexplicable perversions, consequent upon the derangement of the perceptive centres, independent of the intellectual faculties.

The question is considered totally one of psychological medicine, based on accepted physiological doctrines and pathological facts, and, therefore, beyond the intelligent scope of courts, or the opinions of lawyers.

"Letters to Women"† is the misleading title of an obscene book on Hydropathic Midwifery, which it disgraces. The only grains of truth in it are garbled, but for the most part distorted into dangerous dogmas only a little less unfit for medical students than for those to whom it is addressed. It deserves to fall under the law for the suppression of obscene literature.

Education and Labor‡ is an able pamphlet, evincing much thought and sound conclusions on progressive education—an education suited to the present needs of children and youth, with a view to the practical duties of life, instead of the alleged sufficiency of a common rudimentary education to nothing in particular. The author advocates workshops where boys can learn trades, as well as

*Read at the meeting of the American Social Science Association, Saratoga, Sept. 6th, 1877. Lowell, Mass.: Stone, Huse & Co.

†Two papers read before the Philadelphia County Medical Society. By Albert H. Smith, M.D., Lecturer on Obstetrics to the Philadelphia Lying-in Charity, etc. Reprint from *Medical and Surgical Reporter*. Philadelphia: James A. Moore.

*By H. M. Bannister, M.D. Chicago: Reprint from the Chicago *Journal of Nervous and Mental Diseases*.

†On Midwifery and Diseases of Women. A descriptive and practical work, illustrated with numerous cases of treatment. By Joel Shew, M.D., pp. 432. New York: S. R. Wells & Co.

‡Inaugural Address, delivered before the National Educational Association, at the Louisville Meeting, Aug. 14, 1877. By M. A. Newell, President. Baltimore: Kelly, Piet & Co.

public schools where they can learn letters; and just as the few are transferred from the State School to the State College, where they learn to be thinkers, he would transfer the many from the city school to the city workshop, where they would learn to be workers.

Littell's Living Age continues to furnish the cream of magazine literature, increasing in excellence correspondingly with the magnitude of the supply—it being a veritable abstract of the best from all. To new subscribers for 1878, the last six numbers of 1877, containing the first parts of a fine German serial, translated for *The Living Age*, and a serial story by Miss Thackeray, from advance sheets, are sent gratis. For fifty-two numbers, of sixty-four large pages each (or more than 3,000 pages a year), the subscription price ($8) is low; or for $10.50 any one of the American $4 monthlies or weeklies is sent with *The Living Age* for a year, both post-paid. Littell and Gay, Boston, are the publishers.

The American Naturalist will hereafter be published by Messrs. McCalla & Stavely, Philadelphia, Pa., but will continue to be edited by A. S. Packard, Jr., and Prof. E. D. Cope, with the assistance of eminent men of science. The *fresh* hold on this valuable monthly should not only carry with it all its past strength, but gain for it new accessions from new fields. No American science educators can afford to do without it. $4 a year. McCalla & Stavely, 237 Dock Street, Philadelphia. Communications for editors, and exchanges: A. S. Packard, Jr., Salem, Mass.

Barnes' Educational Monthly—whilom *National Teachers' Monthly*—is issued under the publishers' sole imprint and responsibility. While retaining the leading popular features, which have made it a general favorite among teachers all over the country, it purposes hereafter to give increased attention to the practical details of school life and work—to give suggestions and methods for young teachers from experienced co-laborers, a large corps of whom have been secured as regular contributors. It is necessary to all teachers who would be well up in their avocation. $1.50 a year. A. S. Barnes & Co., New York.

"The Sheltering Arms'" Thirteenth Annual Report shows the admirably gratifying result of caring for one hundred and eighty-three children during the year ending April 30th, 1877, *without the loss of a single life or the occurrence of serious case of illness.* The year commenced with 134 children. During the time covered by the report, 441 applied for admission; 49 were received—all that could be accommodated. At the conclusion of the year there were in the institution 133; boarding out, 5. "A few passing cases have been taken in, when we really had no beds, and could only provide for them by placing them out for a time with some proper person." Of the inmates received during the year, fourteen were returns of those who had been cared for previously—a pleasing and emphatic expression of confidence on the part of their parents.

This model charity appeals to the kindliest sympathies of all who would assist, by word or deed, in providing a home for the helpless—an asylum for the homeless. Tenth Avenue and 129th Street, New York.

Books Received.—Infant Mortality in Macclesfield; Exposition of Facts, by A. Y. P. Garnett, M.D.; Chaillé's Origin and Progress of Medical Jurisprudence; Southard on Water Supply; Proceedings American Philological Association; Transactions of Medical Society of Pennsylvania; Report of Walnut Hill Inebriate Asylum; Transactions Medical Society of New Jersey; Transactions of Medical Society of Wisconsin; Report of State Board of Health of California; Report of Board of Health of St. Louis; Bureau of Education Report on Indian Civilization, etc.; Black's Promotion of Medical Culture and Self-Protection; Gillette's Narcotic Effect of Morphia on the New-born Child.

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THE PRESENT POSITION OF SANITARY SCIENCE, FOR ITS FUTURE PRACTICAL ADVANCEMENT.

ADDRESS ON HEALTH.*

By EDWIN CHADWICK, C.B., President of the Health Section.

(*Continued from page* 21.)

State of Sanitation in the Mercantile Marine and as Affecting Quarantines.—But what is the state of sanitation for the conservancy of force, for the maintenance of our great Mercantile Marine, in its competition with the mercantile navies of the world, of the total tonnage of which, according to the last returns (whilst only 2.57 was Dutch, 5.51 French, 6.30 German, 15.03 American) not less than 37.51 was British, worked by 200,000 seamen, of whom about 10 per cent. were foreigners? What, since 1849, when, at the General Board of Health examining for the settlement of the question of quarantines, we found our Mercantile Marine subject to frequent outbursts of epidemic diseases on long voyages, amongst animals as wells as human beings, long after reputed periods of incubation and under conditions sufficient, apparently, for spontaneous generation of the diseases assumed to have been introduced and conveyed from far-distant land sources? What in these states of things have been the advances made, and the sanitary normas obtained—if any—in this great field for sanitation? The only answer that statistics give is the continuance of a nearly threefold death-rate beyond that in the Royal Navy, and the continued prevalence of diseases banished thence in the Mercantile Marine. Our Report was translated into French and Italian, and our evidence was examined and discussed, and its sanitary application to ships was finally adopted, by a congress of the consular and sanitary officers of twelve of the States of Europe in 1851, when Dr. J. Sutherland ap-

* At twenty-first Annual Congress of the British Social Science Association, Aberdeen, Sept. 13th, 1877.

peared as representing our principles. Since then a reactionary movement took place in support of the hypothesis of the exclusive propagation of disease, from person to person by human intercourse, and for prevention, not by sanitation, by the cleansing of places or persons on shipboard or on shore, but mainly by checking that intercourse, by quarantines, by burning clothes, by disinfecting goods, and by destroying germs, the assumed agents of contagion. Subsequently, however, it has been seen that human intercourse on shipboard has been speeded by steam, and on shore by railway transit of people in masses, unrestrained by any quarantines; yet the spread of pestilence has not been proportionately speeded and spread as it should have been, according to the contagionist theory. On shipboard in large transports, we have seen that the passengers have been conveyed with as much safety from epidemic attacks almost as if they had been in a well-managed prison. On shore, I remember the time when, in a town in the most unsanitary condition, even a medical officer has ascribed an outburst of an epidemic to its introduction by a tramp from a common lodging-house where it first appeared. Here in Scotland people and police, on the alarm of a coming visitation, have given their whole attention to keeping out tramps. Now, as I may show, well-regulated common lodging-houses have almost an immunity from epidemic attacks, and the tramp's superior security will be in not going to an ill-regulated place, or into any dwelling in a low neighborhood occupied by the wage classes. In India it has always been held that pestilence has been carried about and introduced by pilgrimages, verified, as is natural, by the disease being rife amongst the moving masses, and the remedy was, if possible, to arrest them; but Mr. Robert Ellis, C.B., a Sanitary Commissioner of Madras, who, unfortunately for our cause, has been suddenly removed from amongst us, attacked with sanitary regulations one of them which had been the source of frightful epidemics, and ensured protection and freedom to the moving masses. Even in France no better views have obtained until lately. It was a belief that the King, Louis Philippe, conveyed typhus about; for was it not seen that year after year, so sure as he went to Versailles, there was an outbreak of typhus! as there certainly was under the common military unsanitary commands, until a medical officer, conversant with sanitation, pointed out that the evil was due to the overcrowding of the barracks by a double population, composed of the king's band and *entourage*, and other conditions, which, being amended, the accustomed visitation of fever was prevented, and health was maintained. We know too well the losses incurred in the movement of military forces under unsanitary commands in tropical climates. On the announcement of the visit of the Prince of Wales to India, serious apprehensions were entertained, which were well founded under the common conditions of such a progress under which seasoned men have suffered, until it appeared that a good sanitary body-guard and a sanitary escort were provided for his security, and that a sanitary force prepared the way for him; and as the event proved, gave to him and his *entourage* security against dangers, which the strongest merely military or unsanitary escort of infantry, cavalry and artillery would in all probabili-

ty have aggravated.* It is observed that by the application of sanitary principles, on the occasion of the Prince's visit to Calcutta, when there was an immense influx of foreign population into that city, such as to have engendered an epidemic outburst under unsanitary conditions, the public health in no way suffered. Continued observation of the movement of cholera, in its great source and constant seat, have negatived distinctly the reactionary hypotheses, and maintained our conclusions. Amongst other points, it is shown that cholera passes over wide tracts almost desert and with sparse population quite away from all highways of intercourse. Closely quarantined districts there have suffered severely from the epidemics, whilst unquarantined districts have suffered little. The Commissioners state in their last Report "that facts regarding the movement of cholera show that, whether or not cordons be drawn round stations, no dependence can be placed on them as a protection against cholera, while the employment of troops may be a direct means of augmenting the mortality." They say that "the entire chain of facts shows the necessity of coping with the disease in the localities themselves; for upon the continued progress of sanitary improvement, especially in the purity of drinking water and of the atmosphere, cleanliness, surface-drainage, etc., in the towns and villages of India, it depends whether the intensity of each succeeding epidemic shall be less or greater than that which has preceded it; so far, at least, as past experience enables us to judge."

Of minor subsequent observations, confirmatory of the declaration that in none of the quarantine stations was there an instance of the propagation of the plague by goods, it was shown in the rivers pollution inquiry, that upwards of 70,000,000 pounds of woolen rags are annually imported largely from districts where plague, fever, small-pox and loathsome diseases prevail, and that these uncleansed rags are there (in Yorkshire) sorted by human fingers, before being placed in machines which tear and separate and cleanse the fibre for manufacture into "shoddy," and that for fifty years the manipulation has not been found injurious to the health of those engaged in it. A similar inquiry made at Paris amongst the paper manufacturers, with a view to ascertain the propagation of small-pox by unclean cotton and flax-rags, was attended by similar results. These facts are stated simply as confirmatory of our conclusion, that, be it as it might with any other means of transmitting disease, there was no justification for staying the transit of manufactured goods from any infected place at one of them. Of the means proposed for prevention by disinfectants, as they are

*By sanitary commands every arrangement was made for his passage through highly dangerous districts before a tent was pitched. "Camps fell into their places in perfect order, and surplus animals were removed to the open country. There was no over-crowding anywhere. Surface sweepings were at once buried in shallow pits. The trench system of latrines with the immediate burial of the sewage under a covering of dry earth was resorted to, and officers were told off to see that no nuisances were anywhere permitted. Wells for drinking water were marked by flags, and care was taken that no other water was drawn for the purpose. Two temporary hospitals were provided, and provisions made for immediately reporting all cases of sickness. The consequence was that not a single case of any epidemic disease occurred in the camp—that the daily sick lists contained reports of trivial cases of sickness or accident only, and were blank for many days." Indian Sanitary Reports for 1877, p. 210.

assumed to be, we had strong evidence that they were only deodorants. Powdered charcoal was put forth as a powerful disinfectant. The crew of a ship loaded with it for the Crimea was severely attacked by cholera, when the blue stages of the disease were almost marked by the charcoal-powder on their faces. One inventor of a preparation of acetate of lead, who almost threatened us with condemnation for manslaughter if we did not exercise our authority to enforce its general use, died from the epidemic, poor man, amidst a magazine of his confidently declared infallible preventive. Admitting fully the infectiousness of certain febrile diseases, it would be unjustifiable to trust to any supposed disinfectants for protection. But nature has given us the means always at hand, without cost or difficulty, of perfect safety: of complete personal cleanliness of clothing as well as of persons, abundance of water, and by replacing the foul, infected air round the sick by dilution in the boundless external atmosphere. In the words of Miss Nightingale, "cleanliness and fresh air are the only protection which a nurse requires." True nursing, she says, knows nothing of infection except to prevent it. Cleanliness and fresh air from open windows are the only defenses a true nurse either asks or needs. What is true of a sick-room or an hospital is equally true of all sources of infection. Clean skins, clean clothes, clean ships, clean houses and clean air, are the only disinfectants, because they prevent infection. The special commission appointed in France to determine what course should be taken for its protection against cholera, after reciting our statements with approbation, say: "Ce sont les rues et les pratiques en Angleterre dans ces matières, vues bien fondées pratiques parfaitement rationelles, que le General Board of Health s'efforce de faire prévaloir et qui, il faut le croire, deviendront la base de tout système sanitaire." The sum of the observation of facts has been a re-vindication of the general conclusion of our Report as regards shipping—viz., "that the substitution of general sanitary regulations of ships in port for the existing quarantine regulations would far more effectually extinguish epidemic disease, and afford better protection to the uninfected on shipboard, whilst it would relieve passengers and crews from grievous inconvenience, abate the motives to concealment of sickness and to false representations as to its nature, greatly lessen commercial expenses, and remove obstructions to the free transit of goods and uninfected persons, which the existing system of quarantine occasions. It follows that we propose the entire discontinuance of the existing quarantine establishments in this country, and the substitution of sanitary regulations." At a late Congress it was found necessary to abate reactionary measures and return towards our doctrine.

The evils of unfounded hypotheses in the maintenance and propagating of disease—amongst others, in directing exclusive attention to minor means of security and in diverting attention from the proved means of security, by sanitation—have operated most injuriously in the maintenance of the comparatively low condition of our great Mercantile Marine. The elements of efficient sanitation—cleanliness, good dieting, good clothing, and care for their regular and orderly application—tend to comfort, to sobriety and security, and altogether constitute in sanitation a factor opposed to drunkenness, disorder and

insecurity, and the waste of property as well as the waste of life and of force. The statistics for one year will serve to indicate the conditions of our Mercantile Marine in respect to the waste of life and force, as well as the waste of property. Of the total number of persons in the Mercantile Marine (203,000) there died 2,700, being a death-rate from disease of about 13 per 1,000, as against 6 per 1,000 in the Royal Navy. An excessive proportion of the deaths in the Mercantile Marine were from the preventable foul-air diseases—fevers, cholera, dysentery, diarrhœa. The total deaths from all causes were 4,076, the rest of the deaths being about two-thirds from shipwreck, and about one-third from violence and accidents. The mean death-rate of seamen in the Mercantile Navy, on the returns of the last three years, appears to be about 20 per 1,000 from all causes, as against 8 per 1,000 from all causes in the Royal Navy; but these rates for seamen in the Mercantile Marine do not include the deaths of passengers, who, so far as may be distinguished in an average of eight years and a half, would be one-third more, making up the total death-rate of the Mercantile Navy to three-fold that of the Royal Navy. It may be mentioned, as indicating the state of demoralization and disorder of the Mercantile Marine, that the total number of desertions within the year (1875) was 28,800, that 3,700 were imprisoned, that 23,900 were discharged, and that a total of 60,000 left before the period for which they had signed articles, and that 49,600 were engaged subsequently to the commencement, apparently to make up for the desertions.

The contemplation of such results, with knowledge of the unsanitary conditions, or of the economical and other conditions involved in them, is very painful; and on my appointment as a political economist to preside at the Department of Economy and Trade, at our meeting in Sheffield, in 1866, I could not help making the losses of life and property at sea the subject of my address, especially to call attention to the economical aspect of the great waste involved, and particularly to the lethal influence of full insurance in reducing responsibilities for ignorance in the commands, and the bad conditions of the crews. I believe that Mr. Plimsoll was of our audience. The facts were well known to the officers of the Department, who were aggrieved at their failure to gain attention to them and action upon them from their changing political chiefs; and I was not more successful. But where quiet but strong and earnest remonstrance failed, passionate sympathy has succeeded in getting public and legislative attention to the tragical losses by shipwreck, and to some of the grievances of the men. There has not been time yet to judge of the results of the measures obtained, and statistics show as yet no reduction of these casualties. Nevertheless, the hulls of vile craft are now to be seen rotting in ports, that, but for the measures already taken, would have been at sea, to the destruction of life by disease as well as by disaster, with fully insured cargoes, but for the recent measures. I hope and believe that a reduction of the losses on the coast have been materially reduced by them.

But the death-rates continue to show that the great unsanitary evils remain in almost unmitigated force in our Mercantile Marine. I do not advance the normal death-rate of the Royal Marine as im-

mediately and strictly applicable to the Mercantile Marine. The Mercantile Marine has, I believe, normas within itself which I had not the means of eliminating. Indeed, ships of those great and grand mercantile organizations, the Cunard Line, which has never lost a ship or a passenger; the Peninsular and Oriental Company, and the Royal Mail Companies' fleet, which become our maritime position, may well compete in sanitation, as well as general security, with the best of the Royal Navy. I believe that other less public mercantile organizations may rank with them. But the elimination of these important instances only make the common death-rates the heavier and the preventable causes of evil the more gross. The continued evil of the Mercantile Marine and the great obstruction to its sanitation, is the ignorance of its commands. When we were charged with the sanitation for the prevention of cholera, measures for the provision of protection of persons on shipboard, we sent inspectors and transmitted instructions to our Consuls at the chief foreign ports to communicate them to ship captains for execution. We were then told in despair by the Consuls that we should be surprised if we had their experience of the ignorance, ruffianism and recklessness of much of our mercantile commands. This corresponded with what I learned in our inquiry under the Constabulary Force Commission into the practice of wrecking on our coasts. The extensive continuance of such conditions, notwithstanding such measures as have been taken to insure fitting qualifications for command, is displayed by the results of the most recent inquiries into the causes of wrecks, a large proportion of which are proved to have been occasioned by culpable recklessness or incapacity. A late statement by our Consul at Pernambuco, of his observations of the mercantile commands, may be cited as corroborative of our earlier information on the topic. He states that "numbers of British shipmasters are no better than ignorant, pugnacious and obdurate seamen," and that to their unfitness to be placed in charge of men and property, the loss of many lives and a large quantity of property annually, must be attributed; and he quotes an illustrative instance of disorder from the log-book of a vessel which left the Mersey with all the crew except two boys in a state of intoxication, "with a crew in a condition in which a cab-driver would not be allowed to proceed along a street." A fact came to my knowledge which is pregnant with large promise for the future for sanitation and for economical results—namely, in practical training on the half-time school principle. In some of those distinct half-time schools to which I have referred as primary normas of sanitation, the boys have much of their requisite physical training at the mast. Those at the Limehouse school were orphans and destitute children of the very scum of the port, which supplies material such as we see for the Merchant Navy. They were free to choose their course. Many had tempting offers of good wages on board Merchant vessels, but the great majority of those who were bodily fit volunteered for the Royal Navy. I inquired why they did so. Was it the martial glare of the Royal Navy that affected the imaginations of these boys? No, their choice was deliberate. The general ground assigned for the rejection of the Mercantile Marine was, "that it was so dirty

and so disorderly." This was from boys, the children of parents the scum of the streets.

The practical outcome from the mixed physical and mental training in a high order of sanitation on the half-time principle (some of which we have had the pleasure of seeing in Sheriff Watson's school and the training ship at Aberdeen), in begetting a repugnance to filth and disorder, and a preference, even at a pecuniary sacrifice, for cleanliness and order, is an outcome for national exertion to make generally prevalent amongst the whole population. I reserve it, to submit it, as a foremost topic for the special attention of the section of education.

I could not but inquire what sort of owners they were of these merchant ships, who could appoint such commands, so dangerous and so wasteful of the capital embarked in them. They were, so far as was known, chiefly small shopkeepers in the ports, people of the smallest means as capitalists, and of very narrow views. It would be well if this smaller service of single ships could be superseded by collectivity, in joint stock organization, such as that of the great companies to which I have adverted, by which alone existing evils must be abated. I shall not be understood as assuming that the smaller craft of the Mercantile Marine may be brought up to the sanitary condition of the Royal Navy. Nevertheless, some observations which I made on the transport of pauper emigrants under the authority of our first Poor Law Board, warrant a confident expectation that far greater sanitary, as well as other beneficent results, are obtainable than may be readily imagined, under the operation of the great master principle of administration to which I have adverted, of making interest coincident with duty—by only paying for results. In the first voyages of transport ships the skippers were paid per head on the numbers embarked, and the explosions of epidemic and the losses of life on some of the long voyages were terrific. By a happy and simple change of the terms of the contract, they were paid only per head on the numbers landed alive, and to the terms on this principle we adhered. On going on board one of the first pauper emigrant ships under this form of contract, I was charmed by the way in which I was received by the skipper; he was so desirous, so pressingly anxious, to receive any suggestion for the improvement of the sanitary condition of the ship. Of their own accord, the skippers, under this form of contract, engaged ship surgeons for the care of the passengers, and transferred to these surgeons—medical officers of health—the pressing responsibilities of the contract, by making their emoluments dependent solely on the number of the passengers landed alive. The working of the principle was excellent. I was otherwise occupied, and obtained no statistical evidence; but my belief is that the sanitary condition of the floating prison was brought very close to the norma I have adduced of the stationary prison, and I am very certain that there were no longer any epidemic visitations upon the passengers. The perceptions and observations of points of sanitation by the ship surgeons acting under these conditions were acute, original, and highly instructive. Moreover, under these conditions, without benevolence, and with the common, every-day principle of interest, we did the work of uncommon, active and enlightened benevolence. We, at all events, secured

for every lone emigrant—who might, after all, be lost—at least one sincere mourner. If we could get the Legislature or local authorities to appreciate and apply the principle of the payment for results, and augment the salaries of officers in proportion to the reduction of death-rates, we should only have an advance in sanitation that, to the public, would be wonderful.

In tracing, as I have endeavored to do, the advance of sanitation for the protection of the population on the sea, and also for the protection of moving populations on land, although we may not at present develop distinct normas specially applicable to them, as in the instances of the Army and of the Royal Navy, yet we have established the power of giving full protection to those moving populations, and of advancing the security of transit and the freedom of trade. To this end it is proved that efficient measures may be taken to remove the remaining obstructions created by reactionism on false and pernicious hypotheses.

(To be Continued.)

The Origin of Heart Disease is frequently to be found in hereditary predisposition; but in many cases it is directly traceable to causes which are easily removable and preventable. In round numbers, about 10,000 deaths are annually caused by heart disease in England alone. The ætiology and geographical distribution of this most agonizing disease have been carefully investigated by Mr. Haviland, Dr. Black and others, and the valuable knowledge acquired as to its nature within the last ten years should have led long ago to a marked decrease of the disease, had that knowledge been utilized in a fairly intelligent manner. It is certain that impure air exercises a most baneful influence upon the heart, and that confinement in badly ventilated houses, cellar dwellings, schools, workshops and factories, is a cause of a great portion of the heart disease unhappily so prevalent in this country. The impure atmosphere of crowded dwellings seems to have a similar deleterious action on the chief organ of circulation to that which it exerts on the respiratory apparatus, and thus we find identical conditions favoring the development of both diseases in one and the same locality. The thorough and effective ventilation of our rooms and houses, our courts and alleys, which proves a preventive in the latter disease, will assuredly hinder the prevalence of the former. In some cases disease of the heart is produced by violent and continued exertion, such as that of lifting heavy weights and violent rowing; but the demon drink is a far more frequent producer of cardiac mischief than is overwork, and by its indirect effects on the muscular structure of the heart, it predisposes, especially in advanced life, to fatty degeneration of the organ itself, and of its great blood vessels. The law which shall effectually control the liquor traffic, may be reasonably expected to diminish the mortality under this head.—Dr. Tatham, Medical Officer of Health of Salford, *Public Health.*

"WHY SHOULD THE EXISTING WORTHLESS SYSTEM OF REGISTERING SICKNESS BE LONGER PERPETUATED?"

ABSTRACT OF A PAPER READ AT THE HEALTH SECTION OF THE BRITISH SOCIAL SCIENCE CONGRESS, 1877.

By Dr. Cornelius B. Fox, Medical Officer of Health for East, Central and South Essex.

The necessity of a complete and accurate system of registering disease will be admitted, by all those who are acquainted with the very alphabet of State Medicine, to be urgent, if any decided success is to be achieved in the prevention of the spread of filth diseases, and if any advance is to be made in our knowledge of the natural history of other diseases. To prove that which is already acknowledged to need no proof, would be waste of time. There would seem, however, to be some difference of opinion as to whether we, who are interested in the advance of the public health of the country, should simply aim at obtaining a more perfect system of registration of disease amongst those relieved at the expense of the public through the rates, or whether we should endeavor to procure a registration of sickness from zymotic affections only, or whether we should attempt to bring about a comprehensive system of the registration of the disease that occurs amongst all classes of the community, analogous to those admirable arrangements for the record of births and deaths of the Registrar-General. The author divided his subject into three parts:—1. A brief description of the existing system, if it can be dignified by such a term; 2. The proof that such a system is worthless; and 3. An attempt to find an answer to the query that forms the title of the paper.

1. The existing system of registering sickness. Under this section the medical relief lists of the 3,000 union medical officers that are weekly sent to the Boards of Guardians were described, and the efforts commenced by Dr. Richardson in 1855, and continued for four years, with the reasons for the relinquishment of the experiment, were adverted to.

2. The proof that the existing system is worthless. In this division a statement was made as to the minimum amount of information with which medical officers of health and other students of State Medicine could be satisfied. Abundant proof was afforded of the utter worthlessness of the medical relief lists of the union medical officer which have been contemptuously called "Beef Tea and Brandy Lists." Some of the entries in the "Disease" column of the sickness returns of the poor law surgeons that illustrated the paper were comic in the extreme, as, for example, such "diseases" as "short breath," "injury," "pulmonary," "brain irritation," "dirty," "hemorrhage," "congestion," "itching," "bad eye," "bilious," "eruption," "infirmity," etc. These medical relief lists were never designed to afford any data for statistical purposes, but were simply intended to give guardians of the poor some idea of the relief in medical attendance and nourishment for the sick administered to the pauper. Union medical officers, whose lives are distinguished by much hard work and little pay,

will not, as a body, render these returns of any value to the statistician unless remunerated for so doing, notwithstanding the remonstrances of the Boards of Guardians with which they are connected. Even if they were all that could be desired, these sickness returns alone deal with *pauper* sickness.

3. An attempt to find an answer to the query which forms the title of the paper. The establishment of a complete system of registering sickness analogous to that for recording births and deaths would involve an interference with the liberty of the average Briton, for which that freedom-at-any-price-loving individual does not at present see the necessity, and which he would consequently resist. As local self-government with a minimum of central interference is supposed to be the perfection of all human forms of government, and as some distinguished wiseacres, whose disciples amongst a certain description of rate-payers are very numerous, fear lest the priestcraft of past times shall give place to a doctor-ridden condition which is equally mischievous, it is requisite, if fresh coercive and compulsory measures are to be obtained for the protection of the people, that the public themselves should demand them of the Legislature. A government cannot safely or wisely advance too far ahead of public opinion, but in order to be of service must lead, direct and guide it.

Unfortunately no scheme has yet or ever can be devised for preventing one man from injuring his neighbor, which does not involve some deterring or compelling influence. The instinct of self-preservation is too strong in human nature, and the strain of competition is in these days too severe to allow of the establishment of that Utopian condition of society in which those least endowed with worldly goods will be found to plunge themselves, and others relying on them for support, into difficulties for the sake of contributing to the public good.

The author objects to the demand for a registration of a certain half dozen diseases, or for the limitation of the registration to the sickness of a particular class of individuals, but urges the expediency of calling upon the government to deal with the whole subject in a comprehensive manner by appointing a commission that would be empowered to take evidence and that would boldly face the difficulties (some of which were referred to in the paper) with which the question is undoubtedly surrounded. He conclusively shows that the establishment of a national system for the registration of disease restricted to no class, for the all-sufficient reason that disease is not confined to any one class, is indispensable, if we are to bring about any considerable decrease in the amount of the filth diseases, and if we are to advance in our knowledge of certain indirectly preventable diseases, such as consumption, etc. Such a system should be laid down on lines parallel to those systems for the registration of births and deaths, of which, notwithstanding their imperfections, we are so justly proud.

The gist of the answer which Dr. Fox then gives to the query which he has propounded is that no good reason exists for the continuance of the present caricature of a system of registering sickness, but that an efficient system will never become *un fait accompli* in this country [illegible] the people demand it of the Legislature.

EXPERT TESTIMONY—ITS NATURE AND VALUE.

By Jacob F. Miller, Esq.

Proceedings of New York Medico-Legal Society, May 6th, 1877.
Prof. F. H. Hamilton, M.D., LL.D., Pres., in the Chair.

It is the object of evidence to establish facts for judicial determination. Such evidence consists of written documents or depositions of living witnesses. These are of two kinds, viz.: Ordinary witnesses, who depose to facts; and experts, or skilled witnesses, who depose to matters of science. The former tell what they know, the latter tell what they think—what they believe. The first state facts, the latter tell what the facts mean.

"An expert," says Worcester, "is a person having skill, experience or knowledge on certain subjects, or in certain professions—a scientific witness." He is one taught by experience. His knowledge extends beyond the reach of ordinary men—it reaches the domain of science.

Experts were known to the Roman law, and during all the history of the common law. Indeed, notwithstanding the unsatisfactory nature of much of the expert testimony produced in our courts, it is difficult to see how the use of this class of testimony can be avoided. Courts and juries are not presumed to be skilled in all the scientific questions which are involved in the cases that they are called upon to try. They cannot understand the evidence produced. They need an interpreter. A witness who speaks German cannot be understood by a juror who knows no other language than the English. To become intelligible, some one must translate it, tell what it means. So a homicide has been committed, a pistol ball has entered the body of a person, who soon thereafter died. Did the shot cause the death? It may or may not have done so. It is necessary that some one acquainted with the effect of gun-shot wounds should be called to testify as to the probable cause of the death, and explain the connection between the cause, the pistol shot, and the effect, viz.: the death. A drug has been administered. Soon thereafter the receiver of the drug dies. Was he poisoned? It requires the skill of one who knows what the poison is, what its effects are upon the human system, and how its presence can be detected, to determine this question; a special knowledge is required from the person who is to give an opinion as to the cause of death. The rule in such cases is well stated in Cooper *vs.* The State, 23 Texas, Rep. 336. The Court said:

"It is a familiar general rule of evidence that witnesses must speak as to facts, and cannot be permitted to give their belief or opinion. It must be left to juries to draw inferences from the facts. But to the

general rule, here stated, there are exceptions. In certain cases certain persons may give their opinions to the jury. I cannot better state the principle on which the exceptions to the general rule repose than by quoting the language of the Judge who delivered the opinion of the Court in the Jefferson Insurance Company *vs.* Cotheal, reported in 7 Wend, 73. In that case Judge Sutherland said: 'On questions of science or skill or trade, persons of skill in those particular departments are allowed to give their opinion in evidence; but the rule is confined to cases in which, from the very nature of the subject, facts disconnected from such opinions cannot be presented to a jury as to enable them to pass upon the question with the requisite knowledge and judgment. Thus a physician, in many cases, cannot so explain to a jury the cause of the death, or other serious injury of an individual, as to make the jury distinctly perceive the connection between the cause and the effect. He may therefore express an opinion that the wound given, or poison administered, produced the death of the deceased; but in such case the physician must state the facts on which his opinion is founded.'"

And Mr. Starkie states the rule in these words: "The general distinction is that the jury must judge of the facts for themselves; but that whenever the question depends on the exercise of peculiar skill and knowledge that may be made available, it is not a decision by the witness on a fact to the exclusion of the jury, but the establishment of a new fact, relation or connection, which would otherwise remain unproved."

And Mr. Greenleaf says that "where scientific men are called as witnesses, they cannot give their opinion as to the general merits of the cause, but only their opinions as to the facts proved."

Physicians may appear in two capacities. When they depose to facts they differ in no respect from ordinary witnesses—their testimony is then confined to their knowledge of the facts of the case. They may also be called as experts. It is in this capacity that we are interested in them to-night. In both cases they are obliged to respond to a subpœna, but in the former only are they *compelled* to testify. Either party to a litigation is entitled by law to the testimony of any person who can enlighten the Court and jury upon the facts of the case; but a physician's opinions, his knowledge of his profession, his skill, are his own, to be kept or imparted, at his pleasure. While, therefore, he might be compelled to come to court, and would be punished for contempt of court if he refused; he could not be compelled to give his opinions, to act as an expert, except, perhaps, in the case of the Government, which has a right to command the services of every individual owing allegiance to it. His knowledge is his own, and he parts with it upon his own terms.

The position of a medical expert is, therefore, one of dignity. His appearance is voluntary. He speaks to science. He produces the connecting link between cause and effect—between the act of the accused and the allegations made against him. As the jury are usually ignorant of the matters to which he speaks, the physician should be a person of the highest skill and strictest integrity. His opportunities for good or injury are great. He may rescue an unfortunate neighbor from the gallows and save his family from disgrace, or

bring them all down in one common ruin. And because the jury are ignorant of the relation between the cause and the effect, and the physician is called upon to supply it, his testimony becomes important, often controlling.

It is not surprising, therefore, if he is questioned closely, too closely often to be agreeable. Indeed, many skillful physicians have refused to testify as experts in any case, preferring to forego the fee rather than submit themselves to a sharp cross-examination. An honest witness is entitled to respectful treatment at all times. But suppose he abandons his neutral position, and evinces an undue partiality for one side against the other, or suppose he is mistaken in his statement respecting the questions of science about which he testifies, shall his feelings be spared and the truth fail of vindication? Justitia fiat ruat cœlum. Let the truth triumph, at whatever cost.

Properly speaking, an expert is not a witness on either side. He does not depose to the facts which form the basis of the judgment. He is not concerned with the result. When he has stated what certain facts indicate, what they mean in reference to the issue joined between the parties litigant, his office ends. The facts upon which the judgment is to be based are to be found by the jury, whose province the expert should not be allowed to invade. He is not to answer the question, Is the accused guilty or not guilty? Is he sane or insane? Those are for the jury. He is to say whether, assuming certain facts to be shown, they, as a matter of science, would indicate what is necessary to meet the allegation against the accused. He might, for instance, testify that certain facts hypothetically stated indicate insanity; but the jury may say that they do not think those facts established. There is no conflict. The expert is not impeached. No reflection is cast upon him. But he does not always remember this. He sometimes acts as if he were a retained witness, a testifying advocate. He feels that he has as deep an interest in the result as the counsel who represents the same side. But their relations are widely different. The counsel presents his side of the case, irrespective of his own private opinions. He may argue whatever legitimately grows out of the evidence. The expert is expected to give his true opinions; to state exactly what he thinks; to tell the truth, the whole truth, and nothing but the truth.

The counsel presents whatever facts can lawfully be introduced bearing upon his side of the case, leaving the other side to take care of itself. Indeed, Lord Brougham declared that a counsel might do everything in his power to gain his cause, even if the State were ruined thereby. Such an extreme doctrine has not found favor with the legal profession; but it is his duty to present whatever facts will aid his side of the cause, and it is his right to make any observations legitimately growing out of them. But such liberties in a witness are utterly inexcusable, and it becomes the duty of counsel to set him right, if he wanders so far from the sphere of his legitimate duties.

To illustrate his neutral position, let us take the case of The State *vs.* Knight, 43 Maine, p. 11. A Mrs. Knight was found dead with her throat cut from ear to ear. All the great arteries and blood vessels of the neck were severed, apparently at a single stroke. Could she have done it herself? This was a question entirely inde-

pendent of the issue before the Court. If she could, and as no one saw her killed, it would be difficult to fasten the guilt upon some other person. If she could not, then who committed the act? Blood was found upon a knife which the prisoner was supposed to have used. Blood was found also upon some clothes and some shingles in possession of the accused. He said it was the blood of a sheep. If so, it was a matter of no significance against the accused. But if it were human blood, it formed a strong item of evidence against him. A chemist examined the blood and pronounced it human blood. But this testimony was not in any proper sense against the accused. It might have been his own blood. It became necessary to connect it with the death of Mrs. Knight. That was not a question for an expert, as it involved no question of skill. All the testimony given by the expert might have been true, and yet the accused be entirely innocent. Let him, therefore, remain neutral, if he wishes his character as a witness to be respected.

As medical experts testify to matters of science, it is for the honor of the medical profession that their testimony should be correct. Not only may ignorance and incapacity bring disastrous results in the particular case under investigation, but the whole profession thereby suffers disgrace. Indeed, in so marked a degree have these appeared in some cases, that Judges have not hesitated to tell the jury that the expert testimony was wholly unreliable, and that they need not be guided by it. It would not be difficult to raise a doubt about the sanity of any man in New York.

One safeguard is in the right of the opposing counsel to inquire into the qualifications of the person offering himself as an expert. This is not a full protection, for the Court itself does not know, or is not presumed to be skilled in any science, except that of law. He is, to a large extent, dependent upon the witness himself, respecting his qualifications. Yet it is held that, after the preliminary examination as to qualification, whether he shall be permitted to testify, is a question of law for the Court. If the Court does his duty, he will not allow a physician to testify as an expert, unless he is specially qualified, by experience, to speak upon the subject of science under consideration. Because a man is a physician, he will not be allowed to testify to everything which comes within the scope of medical science.

In Emerson *vs.* Lowell Gas Light Co., 6, Allen 148, a physician was offered to testify as to the effect of breathing burning gas. The Court heard his qualifications and rejected him. On appeal, the Court above said:

"The testimony offered as to Dr. Bass was that he was a physician, and as such had witnessed the effects of the gas which escaped from the defendant's pipes at a time when the plaintiffs allege that they were injured. The persons whom he saw lived in another house in the neighborhood. The mere fact that he was a physician would not prove that he had any knowledge of gas, without further proof as to his experience; for it is notorious that many persons practice medicine who are without learning; and a physician may have much professional learning, without being acquainted with the properties of gas or its effect on health. And the observation of a man who is at the time inexpert is of no value, and does not qualify him to give

opinions. The Court are of opinion that the testimony of Dr. Bass was rightly excluded."

The Court in the same case held that "one who is an expert may not only give opinions, but may state general facts which are the result of scientific knowledge or professional skill."

In the Commonwealth *vs.* Rich, 14, Gray 333, Jacob Mitchell, a witness, called on behalf of the defendant, testified that he had been in practice about thirty years as a physician, that he had made the subject of mental disease a study, but not a special study; that he had considered the matter only so far, in his general practice, as to determine whether a patient was in such a condition of mind as to require treatment for insanity, and if he was, he had been accustomed to call in the services of a physician who had made the subject of insanity a special study, and had experience in the treatment of mental disease. The Court refused to allow the witness to be interrogated as to the question of sanity or insanity upon a hypothetical case stated as arising out of the testimony. He had not had sufficient experience to qualify him as an expert in cases of mental disease.

In Caleb (a slave) *vs.* The State, 39 Mississippi, Rep. 732, a witness who made no pretensions to any knowledge of medicine or surgery was allowed on the trial to state his opinion as to the character of the wounds received by the deceased. He said that "he had frequently seen gun-shot wounds and wounds made with a knife on the body of men," describing each; but the Court above held that it was error to permit him to testify.

Hence it appears that he who would testify as an expert should be peculiarly fitted for the work of giving opinions on the subject, and have more than ordinary knowledge on the subject. No precise limits can be set. For as science is constantly progressing, the extraordinary knowledge of to-day becomes the ordinary knowledge of to-morrow. A few advanced spirits make discoveries which soon become the common property of the world. The standard of the expert must change with the progress of his science. But as all sciences have proceeded to such great length, it is obvious that any one who would extend his knowledge beyond these limits must be content with a narrower range. And hence the sphere of the expert in any one science is proportionably narrowed. The tendency is to specialties. No one physician expects to master all branches of his profession, and hence no one physician can expect to act as an expert in every class of cases which come under the cognizance of members of his profession.

In Fairchild *vs.* Bascomb, 35 Vermont Reports, 409, the Court said:

"The mere fact that a person was, by education, a physician, if he had not practiced his profession, we should not deem sufficient to justify his admission as an expert. So, if he devoted himself exclusively to one branch of his profession, and had no practical experience in the subject matter to which he was called to testify—as if an oculist was called to testify about insanity—we should not deem him admissible." See also Bowman *vs.* Woods, 1 Iowa, 441; Corsi *vs.* Maretzek, 4 E. D. Smith, 1.

While the Court can inquire somewhat into the extent of the

knowledge and experience of the witness offering himself as an expert, it cannot discriminate between the various schools of medicine. The reason is obvious. The Court is not informed on the subject. The Court is not presumed to know anything about medicine or surgery. Therefore when a medical witness offers himself, and declares his ability to testify, and shows that he has had the requisite experience, the Court cannot reject him. He must be allowed to give his opinion. His knowledge can be tested on a cross-examination, and in all cases he must state the facts upon which his opinions are based. This is indispensable. The reason of it is obvious. He is endeavoring to enlighten the jury upon a question of science. He is stating his opinion of what? If it is not of something similar to the case under consideration, the opinion will be of but little service to the jury. He therefore states the facts upon which his opinion is based, and the jury compare this state of facts with the facts which they think have been proved, and form their conclusions accordingly.

The reasons for this rule are well stated by Campbell, J., in White *vs.* Bailey, 10 Michigan Reports, 159, as follows: "First, it is necessary, in order to enable other experts to determine whether the opinions expressed by the witness are correct, and to enable the parties to contradict them if wrong. Second, it is necessary, in order that if an opinion is given on a mistaken or perverted statement of facts, the truth may be elicited from others to destroy the foundation of the conclusions. And a third reason might be mentioned, which is that the Court and jury may know, from his opportunities, what means the witness had of forming any opinion at all. These are rudimentary principles, which cannot be safely departed from."

So necessary was the stating the facts upon which the opinion was based regarded in Dewey *vs.* Warfield, 7 Maryland, 73, that a judgment obtained through a disregard of this rule was reversed. It was a contested will case. Subscribing witnesses and others were allowed to testify without showing proper qualifications. On appeal, the Court said:

"We do not deem it essential to set out in detail the testimony of each witness. It is sufficient to say that among those examined on the part of the caveators, there were no professional characters—that is, physicians—and that nearly all of them gave their opinion of his mental capacity without assigning the facts from which that opinion was deduced. In regard to these opinions, unsupported by circumstances, there can be no doubt they were wholly inadmissible, as they did not come from professional experts."

It follows from this that professional books are not competent evidence. They are treatises upon certain subjects, stating general principles, but having no relation to the particular case under consideration. The jury want an explanation of that case. Professional books cannot give it. A witness may, however, refer to such books, as containing the generally accepted opinions of the profession, and as sustaining him generally, but cannot read them as part of his evidence. The author was not under oath. He cannot be cross-examined and his knowledge tested. The books do not contain a statement of the facts upon which his opinion was formed. The witness on a trial

gives an opinion upon facts as they are claimed to be proved. In some way he must get a knowledge of those facts. Books deal with general propositions, not with particular cases. Each case needs its own interpreter.

Medical witnesses cannot be asked questions, as experts, which can be answered equally well by other persons. If the jury can know the answer as well as he, the witness is not needed. Hence, whatever lies within the range of men's general knowledge is not the subject for an expert.

In Woodin *vs.* The People, the defendant's counsel asked the physician the following questions: "From what you know of Mrs. Woodin's health and strength, in your opinion could the defendant have carnal connection with her against her will, without resorting to other means than the exercise of his ordinary physical powers? From what you know of Mrs. Woodin's health and strength, in your opinion could a man have carnal connection with her against her will, without resort to violence beyond the exercise of his ordinary physical powers?"

"To each of these questions the counsel for the people objected. The objections were sustained, and the defendant's counsel excepted. The evidence of the opinion of the witness was clearly inadmissible. It did not involve medical skill or science, nor was it a case for an expert. The jury could judge equally well with the witness, after they were in possession of the facts upon which he must necessarily base his opinion. See, also, Van Zandt *vs.* Mutual Benefit Life Insurance Co., 55 N. Y., 169; Kennedy *vs.* The People, 39 N. Y., 255."

Nor can the medical witness give his opinion directly upon the issue presented by the case. This is the province of the jury; they alone determine the facts. He may explain facts, but he cannot find them; they must be found for him or assumed by him. A witness may not be asked whether the accused was sane or insane at the time when he is alleged to have committed a crime, if there be a conflict as to the facts. He may not be asked whether a testator had capacity to make a will. But a hypothetical case may be put to him, and his opinion asked thereon. The jury will see how far it corresponds with the case in hand, and, therefore, how far their judgment shall be guided by it.

In Wendell *vs.* the Mayor of Troy, 39 Barb., 338, Mr. Justice Hogeboom said:

"The medical testimony as to the injuries likely to be produced under a given state of facts was, I think, properly admitted. The witness stated the precise facts on which he based his opinions, and the Court did not withdraw from the jury the right or liberty to consider whether these facts were established by the testimony." People *vs.* Lake, 12 N. Y., 358; Goodrich *vs.* The People, 3 Park, 622.

In White *vs.* Bailey, 10 Michigan, 159, the witness, a doctor, after stating that he had attended the deceased professionally for some nine or ten years previous to his decease, but who had not seen him for two or three months, was asked this question:

"From what you saw, what was his (Mudge's) mental capacity?"

Question excluded. On appeal, the Court said:

"The question, we think, was properly excluded. It asked for the

doctor's opinion of the mental capacity of the testator some two or three months before he made his will. Mental capacity for what? To make a will? For that was the issue. This is a question of law, and not of medical science. It is for the jury, under the instructions of the Court as to what is sufficient mental capacity to make a will, to decide on its existence or non-existence when the will was executed, from the facts testified to by the witnesses, and not from the witness' opinion regarding such facts. The jury, and not the witness, are to draw the conclusion from the facts stated by the witness. The opinion of a physician as to the existence of disease, or a particular malady, and its effect upon the mind, would be evidence. But a physician's opinion regarding mental capacity generally, or the mental capacity necessary to make a will, is, in the eye of the law, no better than that of any other person."

In Shelton *vs.* The State, 34 Texas, 666, in which a father was indicted for the murder of his child, a medical witness was allowed to testify as to the cause of death of the child, and also whether the neck of the child was broken before or after death. The Court said: "The opinion of a medical man, as to the cause of death of the child, and also as to whether the neck of the child was broken before or after death, was properly admitted by the Court to go to the jury. Indeed, there are many cases, as in this, where there was no one present at the death but the deceased, unless it was the defendant, and where it might be wholly impossible to prove the cause and manner of death excepting through the aid of science, when, with the aid of the scientific experience of medical men, the whole facts might become as manifest as though rehearsed by an eye-witness." The prisoner was convicted; but a new trial was granted, because the Court could not see a sufficient intent to kill to make the crime murder in the first degree. This case illustrates the importance, as well as the nature, of medical testimony.

In Woodbury *vs.* Obear, 7 Gray, 469, a medical witness was asked this question: "Suppose all the facts stated by the several witnesses to be true, was Mr. Woodbury laboring under an insane delusion, or was he of an unsound mind?" Ruled out. On appeal, Shaw, C. J., said:

"We think the question put to Dr. Williams, as an expert, asking his opinion whether, having heard the evidence, he was or was not of opinion that the testator was of sound mind, was not admissible in that form. This would be especially irregular where the evidence is conflicting, because it puts it in the power of the expert to give an opinion upon the credibility of the testimony and truth of the facts, which is purely a question for the jury. And then upon the value and efficacy of the facts and circumstances in his opinion thus proved upon the question of the soundness of mind. We think the question as modified by the Court and then admitted was correct, to put the case hypothetically, as thus: If certain facts assumed by the questions to be established by the evidence should be found true by the jury, what would be his opinion upon the facts thus found true, on the question of soundness of mind? If, however, the physician has attended the accused, and had frequent opportunities to witness his conduct and converse with him, then he can give an opinion as to

his sanity or insanity based upon such observations; and after an opinion has been given, a cross-examination will be allowed upon hypothetical questions predicable of the facts then proved in the case, in order to test the correctness of the opinions of the witness." People *vs.* Lake, 12 N. Y., 358.

From what has been said, it is obvious that, in order to be an expert in the true sense of the word, the witness must have had experience in the particular science under investigation. Mere opportunities for observation are not sufficient. He may not have improved the opportunities. He may have considered the profits which should arise from dealing in certain articles, rather than their scientific value.

In Page *vs.* Parker, 40 N. H., Rep., 59, a witness was offered to give his opinion as to the quality of soap-stone in the quarry in controversy. He was shown to have been more or less engaged for forty years in quarrying soap-stone; that he had manufactured soap-stone into pipe for aqueducts more or less for twenty years, and had visited other quarries. But it did not appear that he had ever devoted any time or study to an investigation of the composition and characteristics of soap-stone, or made any particular observations on that subject, so as to be better qualified to give an opinion on the scientific question propounded to him than any member of the jury. Held incompetent. The Court, after stating in what cases witnesses are allowed to give their opinions, adds: "It must, however, be first shown that they are skilled or scientific men, or at least that they have superior *actual* skill or scientific knowledge in relation to the question, before their opinions can be competent. *Mere opportunity for observation is not sufficient.*" 1 Phil. on Ev. 778, Chap. 10, Sec. 40, and Notes.

We have thus seen what are the qualifications of medical witnesses and what is the sphere of their duties. It would almost seem as if their testimony should produce more satisfactory results, and yet within the last ten years trials have taken place in this and neighboring States in which the medical witnesses did more harm than good—did more to mislead the jury than to instruct them. I need not speak of Scheppe's case, the Wharton case, and others a little nearer home. They are all familiar to you. But why does this kind of evidence so frequently bring about unsatisfactory results? We have mentioned incidentally two causes, viz.: incapacity and partiality of witnesses—some know no better, and some did not wish to know better. But there are cases wherein skillful and well-meaning men fail to meet the demands of the case. It is not because they do not understand the general subject under consideration, not because they are unwilling to do their duty, but because they fail to comprehend the demands of the case upon them, and to apply correctly the knowledge which they possess. This most frequently happens in cases of insanity. Let me illustrate my meaning by a case. A prisoner is charged with the crime of murder. It is proved that he committed the act which resulted in the death of his victim, and the circumstances attending the case are such that a jury would infer the intent to kill. He has no refuge except in the plea of insanity. The history of his life is told. All his queer expressions and strange actions are detailed to the jury, who are asked to acquit the prisoner. A hypothetical case containing the facts which are considered proved in the case is

put to the medical witness, and he is asked whether, assuming these facts to be true, he thinks such a person to be insane. What does the law mean by that question? Listen to the charge of the late Benjamin R. Curtis, Justice, in the case of U. S. *vs.* McGlue, 1 Curtis, Reports, 1. The question there was whether the prisoner had committed the act in a state of drunkenness merely, in which case he would be responsible, or whether he was suffering from *delirium tremens*, in which case he would be irresponsible. The learned Judge said:

"The next inquiry is, What is meant by insanity? What is it which exempts from punishment because its existence is inconsistent with a criminal intent? Clearly it is not every kind and degree of insanity which is sufficient. There have been, and probably always are, in the world, instances of men of great general ability, filling, with credit and usefulness, eminent positions, and sustaining through life, with high honor, the most important civil and social relations, who were, upon some one topic or subject, unquestionably insane. There have been, and undoubtedly always are, in the world, many men whose minds are such, that the conclusions of their reason, and the results of their judgments, tested by those of men in general, would be far astray from right. There are many men whose passions are so strong, and whose conscience and reason and judgment are so weak or so perverted, that not only particular acts, but the whole course of their lives, may, in some sense, be denominated insane. And there are combinations of these, or some of these deficiencies, or disorders, or perversions, or weaknesses, or diseases. They are an important, as well as a deeply interesting study, and they find their place in that science which ministers to diseases of the mind, and which, in recent times, has done so much to alleviate and remove some of the deepest distresses of humanity. But the law is not a medical or a metaphysical science. Its search is after those practical rules which may be administered without inhumanity for the security of civil society, by protecting it from crime. And, therefore, it inquires not into the peculiar constitution of mind of the accused, or what weaknesses, or even disorders, he was afflicted with, but solely whether he was capable of having, and did have, a criminal intent. If he had, it punishes him; if not, it holds him dispunishable—and it applies a test by which the jury is to ascertain whether the accused be so far insane as to be irresponsible. That test is the capacity to distinguish between right and wrong as to the particular act with which the accused is charged. If he understands the nature of his act; if he knows his act is criminal, and that if he does it he will do wrong and deserve punishment, then, in the judgment of the law, he has a criminal intent, and is not so far insane as to be exempt from responsibility. On the other hand, if he is under such delusion as not to understand the nature of his act; or if he has not sufficient memory and reason and judgment to know that he is doing wrong, or not sufficient conscience to discern that his act is criminal and deserving punishment, then he is not responsible." Flanagan *vs.* The People, 417. Capacity to distinguish rejected.

This is the question for the jury to decide; but the jury are not presumed to know enough about insanity to judge correctly in refer-

ence to it. They do not understand the evidence. They cannot comprehend its scientific bearings. The aid of the medical witness is invoked. He is expected to tell them what? What his notion of insanity is? No. He may be one of those people who believe that everybody is more or less insane; that as there are no perfectly sound bodies, but all contain within them the seeds of disease and death, so there are no sound minds. Or he may think that the legal test is not a sound one, and wishes to adopt one more scientifically correct, as he thinks. No; he is expected to use the word insane as the law uses it, and in the same sense. When, therefore, a hypothetical case, fitting, as nearly as possible, the case at the bar, is put to him, and he is asked whether such facts, if proved true, indicate insanity, the law means that he shall answer whether the prisoner is insane in the sense indicated by the charge which I have read. Is he insane in the sense that he has not "the capacity to distinguish between right and wrong, as to the particular act with which the accused is charged"? If yes, the witness is bound to say so, and thus aid in acquitting the prisoner. But if he is not insane in the sense above expressed, no matter what the witness thinks of him in other respects, he is bound to say, upon the case put, that he does not regard the prisoner as insane.

The witness has no right to use the word in any other sense. His duty is to aid the jury in ascertaining the fact whether he is insane in that sense, and in no other. If he does not use the word in the same sense, he misleads the jury and causes them to err. Just here has been the mistake which medical witnesses have so frequently made; and after the prisoner has been acquitted, have been astonished at their own acts. And then they talk of the "criminal insane" and "insane criminal." If the medical witnesses would appreciate exactly the question which they were called upon to answer, and answer it honestly and conscientiously, much of the confusion which hangs about this subject would be removed. They would not startle at their own conclusions, or aid in securing results which shock the common sense. Let them, before they testify, inquire what the law demands of them, and strive to meet the law's requirements; and not palm off on the Court and jury what Maudsley thinks, or Ray thinks, or, perhaps, what the witness thinks insanity ought to be.

But some physicians, we have often heard it said here, urge that in their judgment the legal test of insanity is not scientifically correct, and they cannot adopt it—that they have a better test of their own. If they are unwilling to do what the law requires, they have an alternative—they need not testify at all. They will not be compelled to give their opinions. The Court does not want their peculiar notions. If the test is not correct, apply to the Legislature to have it changed. But adopting another test is not changing—it is defeating the law. What would you think of counsel, who, disapproving of a law, should advise his clients not according to the law as it is, but as he thought it ought to be? And in case of mishap, of what avail would such an excuse be? And yet that is the position of the medical witness, whose evidence is guided by his own opinion of what insanity ought to be, instead of adopting the test which the law has prescribed.

From these illustrations and authorities it will appear that the office of medical expert is one of dignity and importance, for it relates to questions of medical science and skill. He should be among the best and wisest of his profession. He is sole master of the peculiar field allotted to him, for no other witness in the case can give opinions, and the judge and jury are presumed to be ignorant of the subjects on which he speaks. They must depend upon him for guidance. If, therefore, he is competent and candid enough to express correct opinions, and conscientiously guides the jury to correct conclusions, he may be vastly serviceable in the administration of justice. But if expert testimony is not to become a synonym for useless testimony, more care must be exercised on the part of some of those persons who offer themselves as interpreters of evidence. They must be interpreters indeed. They must have their opinions first hand. They must, in short, be what they profess to be—skilled witnesses—skilled by experience.

A Chinese Bath House.—A Shanghai correspondent of the San Francisco *Chronicle*, writing of a visit to a Chinese bath house, says:

Within we were accosted by a damp-looking specimen of humanity, with a face shriveled up like a washerwoman's thumb, who proved to be the proprietor, who consented for a consideration to allow us to examine the workings of the establishment.

Pulling aside a dirty curtain we were ushered into a large room, in which a half-dozen tallow dips made feeble effort to illuminate the surrounding objects. A tank some fifteen feet long and ten wide was sunk in the floor to the depth of four feet, and possibly contained five hundred gallons of water, heated by means of underground furnaces to quite a high temperature, and in which I counted fourteen bathers at one time, while at least twenty others were either preparing to enter or completing their toilet prior to departure. The proprietor seemed quite proud of his accommodations, and after politely inviting us to take a bath, which we reluctantly declined, gave us the following information:

The tank is refilled with clean water every midnight, and is not again changed for the twenty-four hours succeeding. His customers arrived at any hour between daylight and midnight, and usually numbered about one hundred and fifty a day. None were refused admission on any account, either of filth or disease. I tried to impress upon the keeper what a great advantage he would have over rival establishments if he would introduce a tooth-brush on the end of a chain, but he was inclined to regard it as an innovation calculated to engender too luxurious ideas, and therefore declined it. Seriously speaking, this frightful system of bathing is the cause of propagating more disease than any other met with in this pestilential land, if we except epidemics, which can hardly be regarded as causes.

STATE CHARITIES—THE CAUSES AND BEST TREATMENT OF PAUPERISM, VICE AND CRIME.

ABSTRACT OF FOURTEENTH ANNUAL REPORT OF THE BOARD OF STATE CHARITIES OF MASSACHUSETTS.

Since the establishment of this Board, one of the great evils committed to its charge, viz., disease, has been placed under the general oversight of another body, the "State Board of Health." For eight years that Board has been vigorously investigating the laws of health and life, and has published many valuable papers upon the *causes* of disease. It is found, in order to prevent or limit diseases, their *causes* must first be understood. By the application of sanitary laws, the fact is now well established that a great amount of disease and consequent mortality may be prevented. In the opinion of the best judges, full one-third of the present diseases may thus be prevented, and human life be greatly prolonged.

It is found that bad air, impure water, improper drainage and sewerage, etc., are not the only fruitful sources of ill-health; but that a large amount of disease is produced by hereditary influences and predispositions. Therefore, in order to promote health and prevent disease, the facts connected with these primary causes must be well understood. We must commence at the foundation; we must lay the axe to the main trunk and roots of the evil, and must not be satisfied with lopping off some of its branches, or removing, here and there, a few of its excrescences.

The same is to be said of pauperism, crime and insanity. It is generally conceded that the two last-named evils are steadily increasing in our Commonwealth; and we fear they will continue increasing, notwithstanding all that has been done and is now doing to provide for the criminal and the insane. In order to check the increase of these evils, we must explore more thoroughly and systematically their *primary* causes. It is in this way, and by such means only, that the great aggregate of crime and insanity, now so burdensome to the State, can be materially diminished.

While there are many causes that operate in common to produce these evils, there are also those which have a direct agency in developing some one of them. For example: while intemperance is perhaps the most fruitful source of all three, there are specific causes, such as certain diseases, which bring on insanity. In fact, crime and insanity have, to a certain extent, their own distinct causes, but, at the same time, they inevitably develop, sooner or later, a great amount of pauperism. Hence, a discussion of the causes and treatment of the two former evils might be carried on, each by itself, while the discussion of pauperism must include, as causes, both crime and insanity. The relations which these forms of human misery sustain to each

other are very intimate and important; and just in proportion as crime and insanity increase, so about in the same proportion will pauperism increase, though not necessarily at the same time. On the other hand, the greater the amount of pauperism, and the more it increases, the more crime and insanity in a community will follow. If, therefore, the primary causes of pauperism can be removed and reached, this serves directly to diminish these kindred evils. There are many secondary agencies that operate as causes; but it is far more important to understand and purify the primary sources, from which these agencies themselves are fed.

No fact in science is better established than that there is a most intimate mental as well as physical relation between the parent and the child—between each generation and the succeeding one. This relation has been well expressed in the proverbs "What is bred in the bone cannot be whipped out of the flesh," and "Like begets like." The hereditary relation has, we believe, a far greater agency in producing social evils than has generally been conceived. This relation extends, by transmission, not only to the form of the body and the features of the countenance, but to every part of the system—to the quality of the blood—especially to those vital organs which give stamina of constitution and beget mental predispositions. Whatever agencies, therefore, are calculated to injure the body or deprave the mind, to incapacitate an individual for self-support or to make him a corrupter of others, should certainly be exposed by the guardians of public charity. Among the most mischievous agents operating injuriously upon the human system, is alcohol; and whether we consider the extent of its abuse in various forms, or the terrible effects which it produces, it certainly stands foremost as a cause of pauperism and other evils. It poisons the blood, and produces a diseased or morbid condition of almost every organ of the body. It affects the brain, impairs the intellect, perverts the moral sentiments and the will, and increases unduly the activity and strength of the worst propensities. It prostitutes the higher to the lower nature of man, changing what should be the true aims and objects of life to those of a low animal nature.

Closely connected with the alcoholic poison is another, which, though not so manifest in its effects, has a most destructive influence upon human welfare. This poison arises from habits of licentiousness, and its evil effects do not cease with the living, but extend through successive generations. The syphilitic poison operates on the human system in so covert a manner and in such a variety of ways, that it is sometimes found difficult to trace out all these effects; but the more thoroughly the pathological and morbid conditions of the body are brought to light by modern science, the more extensively are discovered the mischiefs which this poison has wrought. If the amount of vice, disease and pauperism produced from this source alone could be made known, it would surprise people. In some respects this poison is more destructive of health and life than that of alcohol. But there are other modes of abusing the reproductive organs which injure most seriously both body and mind. A careful inspection of the inmates of our almshouses and hospitals will show a vast amount of suffering from this abuse. It is the hereditary

effects of these evils that makes them especially significant in the production of pauperism and insanity. To aggravate the matter, their effects are communicated in an intensified form from generation to generation, and it is very difficult to check or eradicate them either by human means or through the recuperative powers of nature.

Besides these two poisons, there are other agencies that injure the body and enfeeble the mind, such as narcotics, stimulants, overmedication, etc. Then come irregular habits, want of proper nutrition, and a train of diseases which either destroy their victims, or make them helpless and dependent. When the physical system is impaired or broken, the mental faculties frequently become enfeebled and depraved, so that not only poverty and temporary dependence, but habitual indolence and shiftlessness, also, ensue. Such a state of things makes paupers, who, by natural association, form social and domestic relations with each other. The more such persons become associated together, either in families or communities, the more unfavorable is the influence of one upon another, the whole tendency of things being to sink them lower and lower in the social scale. Worst of all, whatever offspring these persons have are pretty sure to be initiated in vice, pauperism and crime, by the law of inheritance and the habit of association. A careful inquiry into the origin, history and character of the inmates of our public institutions, will abundantly prove and illustrate these statements.

So important was this subject deemed by the Senate and Assembly of New York, that an inquiry into the causes of pauperism was ordered in 1873, which has recently been completed and its results made public. The inquiry seems to have been thoroughly made by the Secretary of the Board of State Charities, occupying his time, more or less, for several years. Over 12,000 persons, scattered in the town, city and county almshouses of the State, were examined with reference to the leading facts connected with their pauperism. Of these, 6,566 were foreign-born, and 422 were born in the almshouse; 3,106 could neither read nor write; 6,133 had been intemperate. Of the 4,147 chronic insane, 44 per cent. had been intemperate. Of the whole 12,000, 2,030 were homeless children, 1,750 of whom had pauper fathers or mothers. The average stay of all the paupers in the almshouse was 4.88 years—almost five years' residence. More than 30 per cent. of the paupers had intemperate parents; many had a large circle of relatives who had been or were then in almshouses. Few persons were found to be paupers by their own misfortunes in business, or sudden loss of property. The dependence of most paupers was induced largely by immoral and sensual habits long indulged, or by habits of idleness and shiftlessness, which, in many cases, might have been early arrested by proper measures.

A careful examination of all the facts gathered in New York, shows that in addition to the hereditary influence, ignorance, idleness, intemperance and prostitution are prime factors that enter into the complex product of pauperism and crime.

Disease itself among the poor, especially where there is not much native energy and perseverance, is a primary cause of pauperism; and if disease becomes chronic or organic, its influence is still greater. It is not the cost of illness (though this is no small item), so much as

its effects in disabling the body for work, and breaking down the mental energies, which does the mischief. And to make the matter worse, the seeds of disease are communicated to their children in an aggravated or intensified form. Besides, the preliminary stages of illness among these classes being often neglected, and the recuperative powers of nature very small, diseases of all kinds, and especially those of a scrofulous nature, are quite sure to have their run, and become chronic. A constitutional disease, becoming chronic and combined with scrofula, is a powerful factor in the production of pauperism. The fact is, hereditary influences in a great variety of ways enter largely into pauperism. Thus, the more extensively sanitary science can be applied among the poorer classes, in the cure and the prevention of disease, the more it helps to diminish pauperism. In this way Boards of Health become public benefactors. Legislatures should expend far more liberally to support Boards of Health.

In the history of the insane, the deaf and dumb, the blind, the idiotic and feeble-minded, hereditary influence is still more apparent. It is well known that these defective classes afford a large number of paupers. In regard to the insane, the fact is pretty well established that the malady in full one-third of the cases may be traced, directly or indirectly, to hereditary influences, and that in the other defective classes a still greater proportion can trace the origin of their troubles to this source.

The following quotation is made from the Report of the New York State Board of Charities, upon the causes of pauperism, the sentiment of which we heartily approve:

"Few persons who have not given detailed attention to the subject, realize how much of vice and pauperism, idiocy and insanity, are hereditary. It is believed to be the duty of society to take positive measures to remedy this evil. What forms these measures should take, and how far the effort should be carried, present the most serious questions which press upon the legislator. It is a subject to which little attention has hitherto been given, at least outside of treatises on physiology; but the time is rapidly approaching when its importance will compel the attention of the moralist as well as the law-maker."

It is agreed that law should protect property and human life. By the evil influences above specified life is sacrified upon a large scale, and a great amount of property is unnecessarily expended, which has to be raised by taxation. The law now provides for removing all nuisances which can be proved injurious, as vacating unhealthy tenements, and eradicating other evils injurious to the welfare of the community. In the rapid progress of science, and the great advances in legislation, some means, we believe, will yet be devised for removing or preventing, to some extent, at least, the evils growing out of heredity.

There are principles and considerations that have a great influence upon our charitable institutions and their inmates, and which cannot be discussed too much or be too well understood. These relate to

Sanitary Agencies.

So important is the influence of these agencies in their various applications to the management of public institutions, that it is deemed

expedient to present here a summary of the facts and laws connected with them.

In the location and construction of such establishments, these principles should be unerring guides. The kind of soil, the lay of the land, the advantages of good air, the supply of pure water, the healthiness of the region, are primary considerations. No one of these conditions can properly be omitted. The advantages already derived from this source, accruing to human comfort, health and life, are invaluable. And nowhere can sanitary science be applied with so much benefit as in our public institutions. Here are congregated together large numbers who, of all others, stand in need of these influences.

Among individuals and families living scattered in the rural districts, there is comparatively little exposure to contagion; but when gathered into villages and cities, the exposures are much increased. Still, even in cities, there are many means of protection and defense. In the matter of exercise, clothing and cleanliness, most people can, to a great extent, provide for themselves; and as to good air, pure water and wholesome food, if they cannot command these, they can, if so disposed, do much towards it. In case of epidemic, contagion and other diseases, there is of course great exposure in a dense population; yet much can be done by individuals, or the public, to prevent, ward off, or modify them. But how do the facts stand in respect to the inmates of public institutions, filled and perhaps crowded with the dependent, the defective, and the diseased classes? They are generally confined, most of the time, to certain rooms or limited quarters, have little or no control over their own exercise, food or clothing, or cannot make sure that their apartments are always kept cleanly or are properly ventilated. In fact, large numbers of them are incapable of taking care of themselves in these respects. How can the insane, the deaf and dumb, the blind, the feeble-minded, or paupers generally, do it?

Those classes are peculiarly exposed, being not only more liable to diseases of every kind, but in case of any epidemic or contagious disease appearing, they afford just the material for such diseases to produce their worst effects. For their constitutions are already impaired and predisposed to disease, or are so impregnated with scrofula, that, like stubble or kindling-wood before the fire, they fall an easy prey to maladies which cannot be stayed till death does its work.

In hospitals, and in those parts of other institutions where the sickly and diseased are collected, sanitary agencies are still more important. In many cases they constitute the main treatment; medicine and nursing are of minor consequence. In chronic, contagious and malignant diseases, such agencies are of the utmost utility. Without them all means of cure or prevention fail. And the more perfectly those agents can be applied, the more satisfactory the results. It is only when the relations of hygiene to the public in all its bearings are taken into account, that the responsibility of the managers and guardians of large institutions can be fully comprehended. The duties of such officers, where the health and lives of great numbers are at stake, cannot be too seriously considered.

One of the most important agents in the production of health, as well as in the prevention of disease, is *food*. Too little consideration is given to this by the managers of public institutions. The diet should be carefully regulated upon established scientific principles; and, in certain material points, the nature of food, and the proportion of its elements, should be adapted to the age and particular wants of those using it. From observations carefully made, and long experience, it is found that a class of persons of moderate constitution, and using but little exercise, may thrive well upon from twelve to eighteen ounces of food for daily allowance; whereas another class, of stronger constitutions and higher grades of health, taking more exercise, must have from eighteen to twenty-four ounces. Thus, so far as the mere quantity is concerned, there would be a difference in the rule as applied to different institutions. The allowances should be sufficient not simply to supply waste, and to support life, but to keep all parts of the body in a healthy and vigorous state. Then the best hours of the day for meals should be well considered. The laws of physiology, as determined by experiments upon a large scale, have established that there should be *from five to six hours between each meal.*

But the quality and kind of food are more important than the quantity or the hours for eating. They must be varied according to age, constitution, state of health, amount of exercise, etc. Some persons require more vegetable, others more animal food. One class require food in which the heat-producing qualities abound; another, that in which the muscle-making ingredients predominate; and another class still, that kind of food which affords the most nutrition to the brain and nervous system. Thus the insane require a diet of better quality, and more nutritious, than those subject to but little "wear and tear" of the nerves. Diet constitutes an essential part of their treatment. So, in case of the sick, suffering from disease, debility and pain, the diet, in quality and variety, must be different, more carefully prepared, and particularly adapted to each individual case. This adaptation of food to the sick is demanded not merely on the score of humanity, but of economy, as, in case of the sick poor, proper nutrition enters largely into the *cure*. Their sickness and dependence are not unfrequently brought on for the want of proper nourishment; hence, the better it is supplied, the sooner the public is relieved of expense. In hospitals for the sick, special pains should be taken in the selection, preparation and adaptation of their food. With those leading a sedentary life, the diet should be different from that designed for those more active or engaged in manual labor. The diet of young people should be different from that of the aged. And inasmuch as some persons, either from habit or constitution, require a larger allowance than others, provision should be made whereby this want should be supplied. Then the proportion between liquid and solid nourishment might be somewhat varied with different individuals. And, in case a regular diet-table was fixed upon, it would be well to vary this on different days and times, for the sake of change or improving the appetite.

Next in importance to food as a sanitary agent stands that of *Pure Air.*

The stomach and lungs are the great supporters of life. The leading objects of respiration are the renovation of the blood, the production of heat, and the removal of poisonous secretions. Nature has established such a law or relation between the air and the lungs, that, to do this work properly, the air must be *pure*, free from all foreign, and especially poisonous substances. So long as the air is pure, it has a perfect adaptation to do its work in the best possible manner; but when mixed with extraneous or poisonous substances, it fails to perform its proper functions just in proportion to the kind and degree of this foreign mixture. The laws of health and life cannot be observed without a proper supply of good air. In no place or community is the importance of good air or ventilation so great as in public institutions. In these are not only gathered a large number of persons, sometimes crowded into close quarters, but frequently they are in an abnormal state—feeble, sickly or diseased. These persons, of all others, stand in need of the purest air; and, at the same time, such is their abnormal condition, that their respiration is constantly poisoning the air around them.

It is well understood that the air may be rendered impure from the least particles of dust, or effluvia, arising from malaria, from decaying vegetable and animal matter, from drains, cesspools, vaults, etc., it may be in the form of vapor, gas or solid substance. But the most common mode of vitiating the atmosphere, and the one productive of the greatest injury, is the poison communicated from one individual to another by breathing the same air over and over. In order to maintain the body in a perfect state of health, it is estimated that there should be provided for the use of every individual three thousand cubic feet of air each hour; and in shops, dwellings and public buildings the amount ought never to go below one thousand cubic feet. In hospitals and apartments used by sick persons, the least possible amount of air provided for each person should be from one thousand to fifteen hundred cubic feet every hour. Then this air must be constantly renewed, or changed; and the poorer the quality is, the oftener it must be changed.

If we apply the laws of healthy respiration to the inmates of our public institutions, we shall find that they are terribly violated; and, if we could get at the actual effects of this violation, they would be found most disastrous. The amount of air provided for different institutions will vary very much, especially in their different departments; and the purity of the same, from constant use, must vary still more. In small rooms, and apartments that are crowded, the average amount of air used by each individual every hour must, we think, range below five hundred cubic feet, and at times it must, of course, become very impure. It should be borne in mind that the feeble, the aged and the sick remain night and day in the same rooms. The effect of breathing so much bad air, in producing debility, in impoverishing the blood and causing disease, language cannot easily describe. The proper ventilation of public buildings, which are to be divided into many apartments and small rooms, and all these to be constantly occupied, is attended with great difficulty. It requires the most expert architects and physiologists; and even then, after applying all the knowledge, skill and experience that can be com-

manded, there will be failures. But our misfortune is, that scarce any thought or attention was given to the matter of ventilation, in the construction of the buildings belonging to several of the State institutions, and it is very difficult to make, now, the necessary changes to effect this object. In some of these establishments the rooms are too small, the ceiling too low, and no suitable provision is made for introducing fresh air or letting out the bad air. Such provision should be made whereby the air in every room and apartment may be constantly changing by currents of atmosphere from outside, and then the egress for the impure air. It is safe to state that in no other way, and from no other source, is so much injury in these establishments produced, as from the want of proper ventilation. It is an evil which ought to receive far more attention than hitherto, and from competent judges, which requires time and experience, and is attended with expense. But one evil can, and ought to be remedied —no part of these establishments should be allowed to be so crowded as they have been in past years.

Next in importance to public institutions as a sanitary agent may be placed *Water*.

It is only when we take into consideration the uses of water in all its various applications, that its value can be fully appreciated. The great interest exhibited within a few years, and the large expenditures made, to provide cities with an abundant supply of water, are strong evidences of the increased value attached to this agent. If this article, in abundance and purity, is deemed indispensable to the welfare of cities, it certainly must be so to the inmates of large institutions. But, unfortunately, the location of several of the State establishments is such that a proper supply of pure water cannot readily be obtained. So marked has been the increased intelligence on this subject, that no site would now be selected for the erection of large buildings without the certainty of obtaining an abundance of water. After an institution is once established, it becomes very difficult, if not impossible, to remedy such evils. In this supply of water there are two important considerations, viz., abundance and purity. Both these conditions are indispensable in order fully to meet public wants.

It is estimated that the average amount of water which ought to be provided for each person in cities and institutions should average between thirty and thirty-five gallons daily. The quantities used at different places vary very much, dependent upon the supply and the views entertained of the virtues of water as a sanitary agent. There should be at least three or four gallons provided for drinking and cooking purposes, two or three times that amount for bathing and washing, and as much more for water-closets and general purposes of cleanliness and drainage. A larger quantity than is here specified could be used to great advantage.

But the quality or the purity of water is, in some respects, more important than the quantity. More or less consideration has always been attached to water as to its effects on health, but it has been discovered of late years that water is a fruitful medium of communicating disease. It is not an occasional outbreak of some epidemic or contagious disease arising from this source, but that the germs of several diseases are now found in waters of common use, and where

it was least suspected. Wells and springs affording, as it was thought, the purest water, were found tainted with poison, either from decaying animal and vegetable matter, or from sinks, vaults and drains. Fevers, dysentery and other diseases in their worst forms have been communicated in this way; and the more carefully the whole subject is investigated, the more often are the germs or the seeds of the disease traced to such a source. And even the water-supply from streams, ponds and lakes is not always free from poison of some kind. It should be borne in mind that the effects of this poison, taken in so small quantities, combined with food, may not be detected at once, and, perhaps, never as coming from such a source; still, it may have a most destructive influence upon the system. The quality of water for outside purposes is not so important; but that used for drinking and cooking is of the highest importance. In providing water for institutions, the greatest pains possible should be taken that this portion of the water, at least, should be pure.

One of the greatest improvements that has occurred for the promotion of health is that of *Drainage and Sewerage.*

And of all communities or places standing in need of these sanitary influences, public institutions must rank foremost. In order that these two agencies should produce their full benefit, much depends upon the lay of the land, and the descent of ground from the location of the buildings.

The cleanliness of every inmate, personal and local, cannot be obtained without these advantages. Wherever large numbers congregate together, the animal excreta accumulate rapidly; as a matter of course, filth of various kinds will accumulate in and around such establishments. The more helpless and shiftless, the more defective in body and mind, are the people comprising any community, the greater and more offensive become the filth accumulations. No dependence can be placed upon such persons as to taking care of themselves in these respects. As these secretions are constantly passing off and this filth is everywhere accumulating, means most active and abundant must be provided, beyond the control of such persons, to carry off their filth accumulations. It is well known how offensive and unhealthful are the gases and effluvia arising from sinks and vaults, from decaying animal and vegetable matters, and from drains and sewers. The facts are well established, too, that the most virulent poisons and germs of the most dangerous diseases are by these means communicated to individuals and communities. And the further the researches are pushed as to the primary causes of disease, the more dangerous are found these exposures. Occasionally there has occurred some sudden outbreak of a particular disease or violent epidemic, which can be traced directly to these sources; the effects of exposure in such cases become at once manifest; but the slow, insidious poison and the milder germs of disease being constantly communicated, the effects of these, in the amount of suffering, sickness and mortality produced, cannot be described.

Then, in the introduction of drains and sewers into public institutions, the greatest care should be taken that this should be done in the best possible manner, so that by watchfulness and repair they shall constantly and thoroughly do the work. The responsibility of

the managers of large establishments, as to providing suitable drainage and sewerage cannot be overestimated. The health and lives of great numbers are placed in their hands.

There is another agency, which ever in a sanitary point of view, is of vast importance—viz. *Work*. Exercise, industry, occupation of body and mind, are powerful antidotes to pauperism, crime, disease and insanity.

There are special reasons why work should be exacted of the inmates of public institutions. *First*. When an individual is supported at public expense, justice demands that he shall render an equivalent in work, as far as possible. *Second*. The principle of economy on the part of the State requires that it should command the services of its wards as far as they can possibly render any. It should be the duty of the State, in establishing public institutions, to make suitable provision, in the purchase of land and erection of buildings, whereby all persons confined in them, and supported by the State, shall work, thus contributing something towards their support. But the pecuniary gain comprises only a small part of the consideration. *Third*. Such are the laws of the human system, that health, and the highest interests of both the body and the mind, require exercise. The sick and the aged, who are too feeble or too infirm, are, of course, exempted. The kind of exercise may be varied; it may be walking or riding; in practicing gymnastics or some kind of sports; or it may be had in some kind of useful employment. Not only the highest degree of health is thus secured, but the comfort and happiness of the individual. The appetite and digestion are improved, sleep and rest made more refreshing, and every faculty of the mind more composed and contented.

This law of exercise is particularly applicable to the inmates of an institution. Not only their habits and character are improved, but the order and discipline of the institution are by this means promoted. The contrast between two institutions, one where the inmates generally are put to work, and another where only a small proportion find employment—the contrast is most striking in the quietness, the good order and healthy expression. This law of work or employment should be faithfully applied in all our public institutions; the more systematically and thoroughly it is done, not only the more will it diminish pauperism, crime and insanity, but improve the condition, habits and character of their inmates.

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Indiscriminate Medication.—An elegant young woman entered a druggist's shop in New York, and asked for a dose of castor oil. "By all means," said the chemist. "Will you have a little cream soda?" "With pleasure," replied the young lady. She had it. After a pause: "Where's that 'ere castor?" "Why, you've had it!" answered the druggist. "But look here," cried the young lady, "I wanted it for my mother!" Tableau.

EDMUND ALEXANDER PARKES, M. D., F. R. S.

distinguished labors of a man like Dr. Parkes should have received no titular recognition."

EDMUND ALEXANDER PARKES.

EN FAMÆ GLORIA SUMMA LAPIS.

The English people have ever been lavish in praising their statesmen and military heroes, and generous in rewarding them. They raise lasting monuments to the memories of Marlborough and Wellington, yet how few of them have even heard of Harvey or of Jenner! In every country badges, medals and titles of distinction have been instituted in order to do honor to military chieftains; the lands of the conquered people, whether at home or in foreign countries, have been liberally bestowed on the soldier, while those who have attended the sick, have healed the wounds and saved the lives of these same conquerors, have been ignored. The exceptions are the very few who, by the greatness of their genius, or by some fortuitous circumstance, have been enabled to associate their names with some great work of art, or with some important discovery, and thus to transmit them to posterity.

The late Dr. Parkes, Professor of Hygiene in the Army Medical School at Netley, England, furnishes a remarkable instance of this neglect. At the request of the Government he took an active part in the organization of this school, and "resigned his post at University College Hospital, and his eminent position of physician of the first rank in civil life," in order to devote himself exclusively to the service of the people. So true is this remark in regard to him, that even the journals that complain of the neglect shown him, do not so much as mention the time nor the place of his birth, when, where nor how he was educated, nor the medical school from which he graduated; and yet few men have done more to promote the prosperity and the welfare of the English people than Dr. Parkes. His services were certainly of a very high order and of incalculable value; and had they been rendered by one of any other profession, would have been appropriately rewarded. A writer in *Public Health* says of him: "He has gone from us with his great services to the country and to mankind unrecognized by any title or distinction, such as would have certainly been accorded to any man of similar eminence and usefulness in any other department of the service of the State, or even in his own, had he belonged to the combatant part of it. Had as many men been killed in fighting under his command as a general as he has saved by his distinguished and his wise counsels, he would have been made a pensioned peer." And the *Lancet*, in a very handsome tribute to his memory, says: "At a time when titles and distinctions are bestowed for services to the State of various kinds—and not always of the most distinguished or meritorious kind—as well as for other reasons, it certainly seemed strange that the unwearied and distinguished labors of a man like Dr. Parkes should have received no titular recognition."

The early history of sanitary enactments in England furnishes some very curious and interesting incidents. As early as 1388 a law was passed which imposed a penalty of twenty pounds on any person who should be detected throwing filth into the streets. In 1489 another law was enacted prohibiting the slaughtering of cattle within the limits of cities and market towns; and both these enactments remained on the Statute Book until 1856, when, with many others, they were removed. The records of the ancient "Courts of Law and Equity" furnish many curious incidents. A zealous antiquarian has discovered that John Shakspeare, the father of the great dramatist, inhabited a house in Henly Street, Stratford-on-Avon, in 1552, and that he, as well as two of his neighbors, was fined for making a dung-heap in the street.*

In 1553, the jurors of Stratford presented certain inhabitants as violators of the municipal laws. From this presentment we learn that ban-dogs were not to go about unmuzzled; nor sheep to be pastured in the ban-croft for more than an hour each day; nor were swine to feed on the common land unringed.†

Again, in 1558, the same John Shakspeare was fined for not keeping his house-drain clean.

The ravages made by Asiatic cholera during the early part of the present century gave a powerful impetus to the introduction of sanitary measures for the purpose of diminishing the mortality, and preventing the recurrence of the epidemic.

England was among the first of European countries to adopt measures for this purpose; her sanitary legislation has been exceedingly prolific, and has now become so complex and intricate, as to render it extremely difficult to get a clear idea of its details. The Germans, outside of her own health officers, have been the most careful students of her laws on this subject, and they have been very liberal in their praise of the energy and perseverance with which she has labored to improve the sanitary condition of the people. The "Public Health Act" (11 and 12, Vict., 6, 63) of 1848 was followed by various measures of less importance between that date and 1858, when the "Local Government Act" was passed. Among the most important of these intermediate acts was the organization of the "Metropolitan Board of Works" and the formation of the "Medical Department of the Privy Council," a measure which has exerted a most important and salutary influence on the course of hygienic reform.

The great reform movement of 1871 and 1872 placed the sanitary laws of England on their present basis; and the English people have thus accomplished a revolution in sanitary legislation more thorough and wide-spreading than has been attempted anywhere else. The thoroughness of this reform is recognized everywhere; and European writers point to England as the great model to be followed in the enactment of sanitary regulations, and in the removal of whatever is prejudicial to the health of the people. While the influence of others is fully recognized, and the labors of some of them have already been acknowledged in the papers of THE SANITARIAN, it will not be unjust to

*Hunter: New Illustrations, Vol. 1, p. 18.

†The proceedings of this court are given in Halliwell's "Life of Shakspeare."

say that, in the accomplishment of this revolution, Parkes has taken a very active and important part; he was, in no small degree, the unseen power that moved the whole mass. Of a quiet and unobtrusive temperament, his influence was felt chiefly through his writings, in the lecture-room and in the Examining Board. His mental organization, his extensive and varied information, and his great practical knowledge of the subject, gained during his service in India and in the Crimea, gave him the skill to organize, and the influence to control and to direct his associates, in the various Boards of which he was a most useful member.

Parkes was born in 1819, near Birmingham. The Bluecoat School has long been famous for the training of men who subsequently became eminent in literature and in science—Charles Lamb, Coleridge and many others received their education there. Here, too, Parkes was educated. As a student at University College Hospital he was remarkable for industry and perseverance. He assisted his uncle, Dr. Anthony Todd Thompson, in his laboratory, and before he graduated he lectured for him on Materia Medica and Medical Jurisprudence. He passed his first examination for the degree of M.B. at the London University, in 1840, and carried off nearly all the honors; he received the medal in Anatomy and Physiology, in Chemistry and in Materia Medica, and was made exhibitioner. In 1841 he took the honors in Medicine, obtained the medal for Physiology and for Comparative Anatomy, and received his degree of Bachelor of Medicine. He completed his professional course in the Medical Department of University College, London, and in 1842, soon after receiving his degree of Doctor of Medicine, he went to Burmah as Assistant Surgeon to Her Majesty's Eighty-Fourth Regiment. Here he laid the groundwork of that reputation which has crowned his later years. His kind and sympathetic nature made him feel for the hardships, the sufferings and privations endured by those entrusted to his skill and care. Many of these were raw recruits, taken from various positions in life in the mild and humid climate of England, but now exposed to the dreadful climate of one of the most unhealthy parts of India. Here he spent nearly four years, devoting himself, with the utmost fidelity, to the discharge of his ordinary duties. But, not satisfied with this, he undertook the study of the nature and the causes of the different diseases with which Europeans are afflicted in that tropical climate. Being naturally of a delicate constitution, his own health began to fail—partly from the effects of the climate and partly from incessant application to his duties, and towards the close of 1845 he was obliged to return to England. His kindness and devotion to the interests of those suffering from disease, and his efforts to promote their comfort, often at the sacrifice of his own, endeared him to all ranks in the service; and while his departure was regretted by all, he was accompanied by the blessings of those whose sufferings he had alleviated. In 1846, shortly after his return, he published his "Remarks on the Dysentery and Hepatitis of India," a work which was highly commended by the *Lancet* and the *London Medical Gazette*. In this work he pointed out the necessity for stricter sanitary regulations, for exercising a more watchful care over the habits of the men, for giving them better lodging, better and more suitable

food, for modifying the style of dress, and for lessening the duties of the soldier, particularly during the heat of the day. His suggestions for treatment were useful and judicious, and an interest was excited which led to the reform of many abuses, to the establishment of many wise and humane regulations, to the preservation of many valuable lives and the saving of much unnecessary expense to the Government. During his subsequent career he never lost sight of the experience he gained in Burmah, nor did his interest in the fate of those who were sent abroad diminish; and so remarkable was this feeling, that the English journals, in noticing his death, have remarked, that while it was a great loss to England, it was a still greater one to India. Later he published his treatise on the "Pathology and Treatment of Asiatic Cholera," a work which much increased his reputation as an observer and a writer, although it had not the great practical value of the former one.

The utter disorder existing in the Medical Department of the British Army serving in the Crimea during the war with Russia, is too well known to need remark. The disastrous results that followed this neglect, and the consequent demoralization of the forces, excited the utmost indignation in England, and the demand for reform was loud and earnest. Although, on reaching home from India, Parkes had retired to private life, and quietly devoted his leisure time to the investigation of those important questions in hygiene, that so much interested him when abroad, his services in India were not forgotten. Finding themselves obliged to reorganize the Medical Departmant of the Army of the Crimea, the Government, in 1855, called on Parkes for advice and assistance. As soon as he ascertained the most urgent needs of the suffering army, he established an efficient medical service, with a good hospital at Renkioi, near Constantinople. Here his services were so great that they elicited the highest praise from the Government, and the warmest gratitude from the nation whose defenders he had rescued from disasters far worse than those inflicted on them by the enemy. The events of this campaign were most humiliating to the English people. When they contrasted the total absence of care, not only for supplying the comforts, but even for preserving the lives of their brave and patient army, with the comparative comfort and efficiency of the French army, they were mortally chagrined. The demand for reform was earnest and persistent.

While this agitation was in progress, Parkes quietly returned to England, and again engaged in private practice, in which he was most successful, became associated with the University College Hospital, and was on the way to wealth and an honorable reputation. A Royal Commission was appointed to make detailed inquiries into the defects in the organization of the medical department of the army. At the head of this commission was Lord Sidney Herbert, who, by his zeal and persevering industry, succeeded in bringing to light much of the negligence and very many of the abuses that had crept into the administration of this department. Besides, sanitary science was now making rapid progress; but most of the advances thus far gained were entirely ignored by the officers in the naval and military service. To reform present abuses and to keep pace with the progress of the

times, a Medical School was established at Netley, for training young medical officers, on their entering the military or naval service. Parkes was invited to assist in the organization of this institution, by Lord Herbert, who was most active in urging its establishment. The commissioner fully appreciated his knowledge of all that belonged to military hygiene, to the preservation of the health of the soldiers, whether in quarters, in camp, or in the field. He had now gained experience in all these different relations, and his counsel was most useful. He resigned his private practice, which was lucrative and honorable, and also his position at University College Hospital, in order to devote himself entirely to this work. His whole professional career pointed him out as the most fit person to fill that position; his former service made him familiar with the defects in the organization of the army abroad, with the necessities of the different climates to which the men were sent, and with the dangers to which they were most frequently exposed. His labors have been of the highest value not only to the Government, but to the world at large. Other men have made local reputations, and have labored faithfully and earnestly to advance the work in which they were immediately engaged; but Parkes has made his influence felt in every part of the civilized world. But, henceforward, his individuality is lost in the institution with which he is associated. As a teacher his influence was diffused wherever a medical officer of the army or the navy was to be found, and this influence will continue to be felt when it can no longer be traced to the source whence it emanated. His writings, too, have left their influence wherever they have been read; yet their author will ever remain the Professor of Military Hygiene at Netley. He was a member of nearly every important Commission in the kingdom; his advice and recommendations were received with the utmost deference and respect by his associates; yet his name seldom appeared in connection with any of the measures he recommended. He is no longer the active agent, who brings about reforms by his direct intervention—he is the unseen power that enlightens, and impels others to do what he inspires. Such has ever been the self-sacrificing character of the man, that he looked forward only to results, never to his personal interest or aggrandizement.

"At the same time that Dr. Parkes carried on the work of the Chair of Hygiene, he took an active part in the business of the Medical Council, as an Examiner at the London University, as a member of the Council of the Royal Society, in committees of inquiry on various important subjects, and in other capacities. Among other useful works that he accomplished, may be mentioned the discontinuance of the use in the army of the old chest-compressing, arm-numbing knapsack, and the substitution for it of the valise equipment which has been adopted in its stead; for these changes were chiefly due to his persevering efforts to effect them, assisted by the support and encouragement of his friend, General Eyre."* Besides being a member of the "Medical Department of the Privy Council," he was also a member of the "General Medical Council of Education." In this position he did much to elevate the standard of medical education; for he

*_Public Health_, March 24th, 1876.

understood its requirements thoroughly and the necessity of proper training in order to fit men to fulfill the onerous duties that were subsequently to devolve upon them. As a member of the Commission on Equipments, and an adviser of the Government on all matters relating to the clothing of the army, to their diet, to the ventilation and water-supply of their quarters, he contributed much to diminish the great mortality among the soldiers.

In 1860 he published his work on the "Composition of Urine in Health and Disease," and in 1866 his "Manual of Practical Hygiene," which passed rapidly through several editions. This work was prepared as a text-book for his class at Netley; but shortly after its publication it was adopted as a manual in all the Medical Schools in England, and is the foundation of the author's reputation abroad.

"On Personal Care of Health," is the title of a small volume, issued by the Christian Knowledge Society, London, which has proved a useful manual for the instruction of the people in everything that relates to the care of their persons, their families and their households. Its style is simple and devoid of technicalities, and it has had a wide circulation.

"Public Health," revised by William Aitken, M.D., is the title of a popular work, which was noticed in THE SANITARIAN for September, 1877.

His last contribution to medical literature was "The Harveian Oration." This oration he left unfinished. It "was read before the President and Fellows of the Royal College of Physicians, on June 26th, 1876, by Sir William Jenner, F. R. C. P., at the request of Sir George Burrows, Bart., President of the college at the time of Dr. Parkes' death." Speaking of a book by Harvey, Parkes says: "This work is lost, or if it exists—" . . . "With this broken sentence the oration ends, and with it the last literary effort of Edmund Alexander Parkes."—Note by Sir William Jenner.

Parkes began his career contemporaneously with the great hygienists of the century. He is the first link removed from the chain of great men who have labored, with singular unanimity of purpose, and with remarkable success, in the work they have undertaken. He died at his residence at Betterne, on the 15th of March, 1876.

We call to mind but one name with which Parkes can be directly compared, that of Fonssagrives, Professor of Naval Hygiene in the Naval Medical School of Val-de-Grace. Eminent and honored as a teacher, clear and concise as a writer, he presents many strong points for comparison; he is, however, more disposed to inquire into the nature of phenomena, to analyze and investigate in the true scientific sense, while Parkes was a great observer, and had great facility in combining and organizing—and herein lay his strength.

The *Lancet*, in an obituary notice, gave him credit for "fine analytical powers," but said that "he did not equal others in brilliancy or grasp," and the same journal declared him to be "the ablest teacher of hygiene in England." This last proposition is undoubtedly true; he was a teacher rather than a scientist, his mind was fitted for combination rather than for analysis, for observation rather than for critical investigation; hence his success as a teacher, whether in giving didactic instruction to his class, or in demonstrating truths and in

combining elements in the laboratory. Besides his happy facility in combining elements, he had great fluency as a speaker, and this gave great clearness to his demonstrations and rendered the various subjects he presented in practical hygiene at once clear and simple. A profound thinker has said that great minds are not remarkable for the great abundance of ideas; but for the possession of a few capital points, a limited number of clear, well-defined principles. The bird of ordinary strength flits from branch to branch, and from tree to tree, ever seeking variety, but always keeping within the limited range within which it dwells; while the eagle plants himself on the highest peak of the Andes, and, from its lofty summit, looks down on the varied scenes that are passing beneath him, and with one piercing glance seizes, as it were in one idea, what is passing within the range of myriads of beings scattered over hill and vale below. So it is with the man of genius: he seizes some capital point, or limited number of points, and thence proceeds at his leisure to analyze and investigate. Such a mind is not constituted to make a teacher; for it has only reached this breadth of grasp when it has gained its full vigor; but the mind of the person to be taught proceeds from particulars to generals, from simple to complex; and he is the most successful teacher who can guide him in this journey with the fullest understanding of his ability and powers of endurance, and the clearest knowledge of the intricate and often rugged path along which he is to guide him. But the vast majority of teachers *instruct* their scholars as the professional guide conducts the traveler along the rugged paths over the Alps; they repeat the oft-told tale, but leave the mind to gain whatever inspiration it can from the grandeur of the scenery around; it requires genius and the practiced eye of the artist to select the most advantageous position, and thence point out the beauty, and the magnificence of the ever-changing scene. Parkes, then, has nowhere left us the evidence that he possessed great analytical powers; his mind was better adapted to the synthetic method, and in his most successful efforts he follows the process of induction. Yet Parkes was admirably fitted for the sphere in which he was placed; he possessed extensive and varied erudition, and was, for some time, editor of the *British and Foreign Medico-Chirurgical Review*, before that journal began to lose its freshness and vigor. His former friends and associates, in various parts of the kingdom, have proposed various plans for erecting a memorial to him. It will probably take the form of a museum and laboratory to be erected in University School, London, where he received his early training.

Quo te merentem læta Britannia
Honore tollat, quas tibi gratias
Ob milites salvos rependet
Ingenio vir et arte præstans?

T. P. C.

Editor's Table.

Modern Homœopathy.*—Homœopathy is making rapid strides of late towards rational medicine. The errors of Hahnemann are renounced by some of his disciples no less vehemently than his truths are advocated by others; and both his errors and truths are being scrutinized as they never have been before. No reader of THE SANITARIAN need wince at our allusion to the *truths* of Hahnemann. *Contraria contrariis curantur* has its exceptions; and these are *similia similibus curantur*. Catholic medicine accepts both.

Modern Homœopathy has not only doffed the cloak of inherent drug power depending upon the number of attenuations or triturations through which a medicine may have passed, but boldly discards all pretensions to being any longer considered a new school. "The idea of similars was enunciated long before the Spartan republic, in a book on the relations of medicine to man, attributed to Hippocrates; and, at any rate, the product of a remote period. The sentence is in original Greek, and says: 'Sick people are cured by remedies which produce analogous diseases.'" With this bold stroke our author captures the venerated Father of Medicine, avows Homœopathy to be a legitimate son, and heir to most of the modern discoveries in the art of healing. And, with the enthusiasm common to new converts, he, for the time, forgets the instruction of his Alma Mater at Ann Arbor, where he tells us he attended lectures in 1857; but seems to recollect little else he learned there, except, "during the long six months' course, almost daily I heard Homœopathy, as all medical students hear it, denounced bitterly as an atrocious imposition upon the credulity of mankind. . . . . Which received a new impetus by listening to the lectures of the venerable Charles A. Lee, in 1861, in the University of Buffalo." Under such auspices, our author proceeds to remark, "When I began the practice of medicine, I supposed it was a fixed science, as certain in practice as it appeared true in theory. I thought we had fifty specifics for every disease. I know now we have a hundred diseases without a specific. . . . After more than twenty-five years of earnest pupilage in the various departments of our science, I feel that I have but a smattering of each; but this I *do* know, that there is *certainly something* in Homœopathy. . . . The while I am still an *all*-opath, and, doubtless, always will be, though free to select from all sources, at the risk of being considered heretical."

* What is Modern Homœopathy? By S. W. Wetmore, M.D., formerly Professor of Descriptive and Surgical Anatomy in Medical Department of Worcester University, Cleveland, Ohio; for many years Demonstrator of Anatomy in Medical Department of University of Buffalo; Member of Erie County Medical Society, Buffalo Medical Association, etc., etc. Reprint from *American Observer*, Detroit, Mich.

Had our author been an apt student, he would certainly have learned in a much shorter period of time than twenty-five years that which he now avows with so much vehemence, that true medicine makes no exactions of her votaries other than the conscientious use of whatever means may appear to be most promotive of recovery. Equally negligent must he also have been of the instruction "of the venerable Charles A. Lee," or he would not now just begin to comprehend the various therapeutical effects of different doses of the same medicines, which in some cases afford him such convenient illustrations of *similia similibus*—but no less strikingly, *contraria contrariis—curantur*. Moreover, he never would have scandalized either of the medical schools in which he studied, or the profession which he professes to follow, by the intimation that specificity is a chief feature of "old school" medical instruction. This, at least, he must have learned from his new love—for specific remedies constitute one of its leading characteristics. He also notices, with much apparent comfort, a paper on the value of small and frequently repeated doses, read before the New York Medical Journal Association recently, by Dr. S. H. Dessau, while he seemingly accepts the position of the homœopathic physician only as defined by Dr. Holcombe: "one who uses the surgical, obstetrical, mechanical and chemical measures of the old school, and in the treatment of disease is guided by the homœopathic law" of *similia similibus curantur*. "This is the fundamental idea of Homœopathy, its true basis, its corner-stone, its only essential element. All questions of doses, pellets, globules, tinctures, of dynamizations, of what Hahnemann said, of what this or that disciple said or did, of imagination, diet, etc., etc., have no logical bearing on the question, and are altogether collateral and impertinent." This is *modern* Homœopathy, according to the most advanced of its followers, and is, at least, a surrender of half the battle-ground. It is the result of an established standard of education, emulating their adversaries.

It is well known that the Hahnemanian doctrine of *infinitesimal doses* has been the big horn of the dilemma of Homœopathy—the chief point of attack and the hardest to defend. That the shaking up of one drop of any medicinal solution with ninety drops of alcohol should have the effect of increasing its power, and the shaking up of one drop of that solution with another ninety drops of alcohol should still further increase the power, and so on indefinitely, even to two hundred or more dilutions, until finally its power becomes so increased as to be dangerous for use, has never been defensible before intelligent people. All nature bears evidence to the absurdity of such a doctrine; for it is impossible for any one to be so situated in life as not to be exposed to the necessity of constantly receiving, in

the form of dust and vapor in the atmosphere, or solutions in potable water, quantities of medicinal substances—happily attenuated to the highest degree of homœopathic potency—without any appreciable effects whatsoever. This is the surrender by the modern leaders of Homœopathy, and it should be met with a generous spirit.

Contraria was scarcely a less fanciful theory of Hippocrates, than *similia* of Hahnemann. Both are partially right; and the question of *how* the cure is effected in any given case, is of infinitely less importance than the fact of cure, no matter which theory is in the ascendant. Let it not be understood, however, that the alleged successful result of cases is ever to be accepted as a measure of medical skill. Successful cases are the universal boast of quackery, and constitute the trade in medicine which has, in all ages, been a fruitful source of human misery. Enlightened medicine depends upon an accurate knowledge of the structure and functions of the human body in its healthy condition, and the power of distinguishing deviations from this condition. Without this knowledge all medication is empirical and dangerous.

Medicine is no longer a mere conjectural art. Physiology now comprehends not only an accurate knowledge of the functions of the chief organs and tissues of the human body, but of the molecules, of less than one-twenty-thousandth part of an inch in diameter, of which the tissues and organs are constituted, and almost the process of their development. Pathology is equally advanced. By it the relations of morbid conditions, and the symptoms of the diseases which cause them, are explored and determined in the same manner as the healthy body is explored with a view to a knowledge of its structure, and no less completely. Indeed, no amount of professional experience, "successful cases," exclusive doctrine or speculative theory of any kind, can withstand the logical facts of modern investigation. And they not only doom to inevitable oblivion existing fallacies, but they are bulwarks for the future.

All who call themselves physicians can well afford to lay aside everything that is in the least degree speculative, for a new rehearsal under the light of scientific investigation.

The various subdivisions and specialties, which the growth of modern medicine has rendered necessary, are inviting fields of labor; and every one of them distinctly points to the sources of all future progress—exact scientific investigation. Each new fact, patiently grounded on exact knowledge and established beyond question, though it may, for a time, appear to be an idle and useless addition, may eventually fructify into some useful generalization, applicable, in the most unexpected and startling manner, to the prevention or cure of disease, and the promotion of human happiness.

Death-rates per 1,000 inhabitants, annually, from all causes and certain special causes.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Deaths under 5 years.	Total No. of Deaths from all Causes.	Per 1,000.	By Violence.	Small-Pox.	Diphtheria.	Scarlatina.	Measles.	Croup.	Whooping-Cough.	Typhoid Fever.	Typhus Fever.	Puerperal Diseases.	Diarrhœal Diseases.	Consumption.	Lung Diseases other than Consumption.
New York' 1 081,500—5 wks. end'g Dec. 22	887	2151	20.62	81		134	82	13	71	18	35		32	55	348	325
Philadelphia, 850,900—5 wks. end'g Dec. 29	509	1454	17.76	37		71	81		51		45	2	12	18	252	165
Brooklyn, 528,000—4 wks. end'g Dec. 22...	284	736	18.31	18		45	46		23		1		14	14	133	94
St. Louis, 500,000—5 wks. end'g Dec. 29...	216	508	10.38	18		29	11		11	1	12	2	4	14	65	78
Chicago, 460,000—5 wks. end'g Dec. 29.....	289	603	13.63	21	10	35	26	6	39	7	9		4	7	61	63
Baltimore, 350,000—5 wks. end'g Dec. 29...	248	606	18.	10		62	15	1	29	5	27		3	5	120	42
Boston, 363,000—5 wks. end'g Dec. 29.....	204	623	17.81	31		51	5		16	5	14		5	8	123	82
Cincinnati, 280,000—3 wks. end. Dec. 1, 8, 22	75	225	13.92	11		9	2		3	3	8		4	9	47	29
San Francisco, 300,000—month of Nov....	143	401	16.04	24		45	2	3	5	1	26		1	17	49	39
New Orleans, 210,000—2 wks. end'g Dec. 23	52	222	27.48	8	6	1			2		2		1	3	38	25
Washington, 160,000.....																
Pittsburgh, 145,000—month of Dec.....	118	241	20.	17	30	46	4	1	4	5	9		2	4	27	21
Newark, 126,000.....																
Providence, 103,000—month of Dec.....	65	182	21.2	7		33	2	2	8	2	3			3	28	16
Milwaukee, 123,000—month of Nov.....	91	149	14.53	2	27	10	4		4		5	1	1	3	7	7
Rochester, 70,000																
Richmond, 77,000—5 wks. end'g Dec. 29...	50	123	16.59	5		2	5		1		1		2	6	24	9
New Haven, 60,000—month of Dec.....	49	104	20.8	2		20	10		3	2	2			2	12	7
Charleston, 57,000—4 wks. end'g Dec. 29...	28	114	26.													
Toledo, 50,000—month of Nov.....	30	58	13.92	5		9	2		2	4	1			5	5	3
Mobile, 40,000—month of Nov.....	22	69	20.7	7					1		1		1	5	16	2
Dayton, 36,000—month of Dec.....	15	35	11.66			2			1		2				3	3
Nashville, 27,000—month of Dec.....	21	50	22.22	2		7			2	1				1	4	11
Wheeling, 28,000.....																
Buffalo, 170,000—month of Dec.....	39	130	9.17	6	1				3	3	1			4	19	12
Knoxville, 13,000—month of Dec.....	3	6	5.53			1					1					
Paterson, 40,000.....																
Petersburg, 20,000—4 wks. end'g Nov. 24..	15	39	25.35	2		1					1		2	2	6	2
Selma, 8,000—month of Dec.....	6	12	17.					2							2	4
Elmira, 20,090—month of Dec.....	9	32	19.12			13	1				1				7	3
Yonkers, 18,000—month of Dec.....	3	23	15.33	2			1			1					5	1
Memphis, 45,000—2 mos. end'g Dec. 31....	48	160	21.33	12		4	1	1	1	2	2		1	14	25	17
Detroit, 115,000.....																
Syracuse, 60,000—month of Dec.....	8	55	11.			1			1		2				12	5
Reading, 40,000.....																
Sacramento, 21,000.....																
Minneapolis, 44,000.....	8	28	12.	3		3					1		1	1	3	3
Bowling Green, 6,000—year 1877.....	43	104	17.33	4		16			1		2		1	3	13	3

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Correspondents under this head are earnestly requested to send their reports promptly, and latest estimated population.

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Foreign.—United Kingdom of Great Britain, during three weeks ending Nov. 10th, 18,021 births, and 10,510 deaths, were registered in London and twenty-two other large towns, and the natural increase of the population was 7,511. The mortality from all causes was, per 1,000, in London, 21.33; Edinburgh, 20; Glasgow, 21.66; Dublin, 25.66; Portsmouth, 16.33; Norwich, 23.66; Wolverhampton, 27.33; Sunderland, 20.66; Sheffield, 22.33; Birmingham, 24.33; Bristol, 21.33; Liverpool, 25.33; Salford, 27.33; Oldham, 28.33; Bradford, 22; Leeds, 20.66; Hull, 21; Newcastle-upon-Tyne, 23; Leicester, 19.66; Manchester, 26; Nottingham, 18.33. Other foreign cities at most recent dates, per 1,000—Paris, 23; Rome, 24; Vienna, 24; Brussels, 25; Berlin, 24; Hamburg, 21; Calcutta, 32; Bombay, 50; Madras, 101; Amsterdam, 23; Rotterdam, 18; The Hague, 22; Christiana, 21; Breslau, 22; Buda-Pesth, 33; Turin, 22; Alexandria, 51; Copenhagen, 19; Munich, 32; Naples, 24.

Providence.*—During the year 1876, there were, in Providence, children born, 2,631; persons married, 1,898; deaths, 1,865.—"Estimating the population, in the middle of the year 1876, at 101,500, the ratio of births, marriages and deaths to population was as follows: Births, one in 38.58, or 25.93 per 1,000; marriages, one in 53.48, or 18.70 per 1,000; deaths, one in 52.42, or 18.37 per 1,000. The concise summary of carefully tabulated statistics, of which this report almost wholly consists, but in the compilation of which the Sanitary Superintendent of Providence is so justly distinguished, presents many interesting and instructive illustrations of the value of careful registration. During the year 1876, each one hundred married women in the city, between 15 and 50 years old, born in Ireland, bore eight children more than the same number of women born in the United States. The proportion of children to women born in British America was about the same as to Irish women. In ratios for different nationalities, the births were, to each hundred women: United States, 13.53; Ireland, 21.54; England, Scotland and Wales, 17.59; Germany, 18.12; British America, 20.23; Portugal and Western Islands, 33.33; other foreign countries, 23.57. Total: United States, 13.53; United States and foreign, 16.57; foreign, 20.71. Of all the married women in the city, between the ages of 15 and 50, almost exactly one in six had a child during the year.

Still-births, 149, or one in 17.66—5.70 per cent. of all. Of the whole number, 69, or 46.31 per cent., were of American mothers; 60, or 40.27 per cent., were of Irish mothers, and the remaining 20, or 13.42 per cent., were of mothers of other nationalities. The proportions were as follows: American mothers, 1 in 17.95; Irish, 1 in 15.56; other foreign countries, 1 in 22.90.

Of deaths it is particularly interesting to notice the aggregate and average age at death, native and foreign, for 21 years: 1856, average age, native born descendants, was 26.90 years—less than it has ever been since; in 1876 the average age was 33.71; in 1866, it was 36.85; 1868, 36.54; 1867, 36.47; 1871, 35.34; 1864, 33.48; 1875, 33.28; 1873, 33.27. All other years in the twenty-one, it was less than in 1876, showing, in the aggregate, an average increase of longevity, during 21 years, of 6.37 years. Average age at death, of foreign born descendants, for the same period, was, in 1856, 15.75 years. In 1876, 24.20—an increase of 8.45 years. There were, during the while, variations, as in the native born, but the lowest was the initial year. Of both native and foreign, 1856, the average age was 21.42; 1876, 27.63—increase, 6.21 years.

There was about the same improvement in the ratio of descendnts under five years of age. In 1856 the ratio was, of the total number of deaths, native born, 37.15 per cent., 1876, 34.29. Foreign born, 1856, 54.95; 1876, 43.13. Aggregate—1856, 45.91; 1876, 38.98.

Surely a profitable lesson in sanitary administration. Providence being one of the best examples, both of length of time and competent supervision.

Of the chief causes of death, consumption killed 284, or caused 15.34 per cent. of the deaths from all causes. A brief table, by periods of five years, from 1840 to 1874 inclusive, and for the whole period of 35 years, shows an improvement in ratio from 26.58 to 15.17 per cent.; and in the last seven years, 1870 to 1876, from 19.06 to 15.34; in 1873 the ratio was 13.57; 1874, 13.76. The next lowest was in 1876. Of the ratios of death from consumption, between native and foreign born, there was but little difference. Native, 49.71; foreign, 50.29. Of diarrhœal diseases, the descendants of foreign parentage were

* Twenty-Second Annual Report upon the Births, Marriages and Deaths in the city of Providence, for the year 1876, by Edwin M. Snow, M.D., Superintendent of Health and City Registrar.

147 for each 100 native; but in this connection notice is taken of the fact that of the 38,730 children born during the 21 years, 21,320, or 55.05, were of foreign parentage, and only 17,410, or 44.95 per cent., of native parentage—being 122 foreign to each 100 American.

Typhoid fever, in 1876, killed 33—less than half the number for 1875. The average, for 21 years, is given at 42; but in some years the estimate includes "fever," "bilious fever," and about 30 from typhus fever.

Literature.

The International Medical Congress' Transactions at the Centennial,* comprehended in a volume of twelve hundred pages, royal octavo, is a worthy monument of the greatest convention of medical men ever held: a convention of representative medical men from every part of the globe, organized as a purely scientific body, presenting, by carefully prepared essays and discussions, the status of medicine in every part of the world at the period of the American Centennial. While the first three hundred pages of the volume are taken up with the historical addresses on the several branches of medicine in the United States, the bulk of the volume consists of papers and discussions before the several sections into which the Congress was divided, covering every branch of medical science in its largest sense, by men of the most varied and extensive experience. And although in no sense a systematic work on medicine, it is, notwithstanding, a work of great practical utility, enhanced by numerous excellent wood-cuts and a copious index.

The work is singularly free from typographical errors, and shows throughout the wisdom of the choice of a learned and skillful editor.

It is not possible, consistent with our space, to give even the titles of the different subjects discussed, much less a synopsis of them. It will suffice to state that, besides the History of the Centennial Medical Commission and the International Medical Congress, by Dr. J. C. Hutchinson, and the Address of Welcome, by Dr. S. D. Gross, of Philadelphia, there were eleven historical addresses: On Medicine, by Dr. Austin Flint, New York; Hygiene, by Dr. H. I. Bowditch, Boston; Toxicology, by Dr. T. G. Wormly, Columbus, O.; Surgery, by Dr. Paul Eve, Nashville; Biography, by Dr. J. M. Toner, Washington; Obstetrics, by Dr. Theopholis Parvin, Indianapolis; Medical Jurisprudence, by Dr. S. E. Chaille, New Orleans; Mental Hygiene, by Dr. John P. Gray, Utica; Medical Literature, by Dr. L. P. Yandell, Louisville; Medical Education, by Dr. N. S. Davis, Chicago; Medical Staff, U. S. Army, by Dr. J. J. Woodward, U. S. A., Washington:—that it is the most valuable contribution to the literature of American medicine hitherto published; and for all who would become acquainted with what has been done for medicine by Americans, this work is indispensable.

Hospitals for many centuries have been regarded as popular expressions of sympathy and charity for the sick and needy. Notwithstanding, taken in the aggregate, their utility in lessening human suffering may well be questioned.

According to the work before us,* the first people to establish hospitals or infirmaries for the sick and injured of the poorer classes, were the Buddhists and fire-worshipers, several hundred years B. C. "The Buddhist, taught to believe that every living creature is sacred, does all he can to prolong life—and to this end he builds hospitals, not only for men, but for animals and even insects. The

* Transactions of the International Medical Congress of Philadelphia, 1876. Edited for the Congress by John Ashurst, Jr., A.M., M.D., Fellow of the Coll. of Physicians, Professor of Clinical Surgery, University of Pennsylvania, etc., etc. Philadelphia: Printed for the Congress. 1877.

* Hospitals: Their History, Organization and Construction. Boylston Prize Essay of Harvard University for 1876. By W. Gill Wylie, M.D. New York: D. Appleton & Co.

Christian, following in the footsteps of his Master, extends his love and sympathy to all mankind, and in his efforts to show his sympathy by his acts, he builds hospitals to prolong life, and to relieve his suffering fellow-beings."

The *temples* and *valetudinaria* of the ancient Greeks and Romans, in use ten or twelve centuries B. C., although in some respects similar to hospitals, were not used for the purpose of treating the sick poor, but for the wealthy classes. "They were probably something like our private hospitals—water-cures. Of similar import are the caravansaries or resting-places for travelers near the shrines and temples in the East, which have existed from time immemorial.

After the birth of Christ, when Jerusalem and the roads leading thereto were crowded with pilgrims, these old temples and resting-places, and other special accommodations, were used for the sick in common—for the poor as well as the rich. And later, when monasteries and convents were established, these institutions were provided with special apartments for strangers and paupers. And among the Romans, in particular, apartments were provided in their houses for guests, which they called *hospitalia*, from which word *hospital* is derived.

But it may be safely stated that until the sixteenth century, when medicine began to assert its independence of the priesthood, hospitals of every kind were, in the main, a bane instead of a blessing. They were pest-places, to which the poor and the unfortunate were sent to die. Cleanliness and ventilation were not even recognized, much less practiced; and the terrible epidemics of the time were frequently excited and commonly promoted thereby. And it took the doctors a full century after being emancipated from priestcraft to comprehend enough of the nature of plague, typhus and cholera to think of *ventilation*—the very first condition essential to a hospital. And from that time—about the beginning of the eighteenth century—to this, has accumulated whatever of benefit which has been conferred on mankind by means of hospitals; meanwhile there has been much injury. Within the last one hundred years, many of the best-appointed hospitals in both Europe and America have shown death-rates considerably larger than under extemporized roof or tent coverings for corresponding numbers of sick persons with the same diseases. Out of this common experience our author has deduced the following conclusions, which we heartily endorse:

"1. That the hospital should be placed on a large area of ground, so that the pavilions can be widely separated from the administrative building and from one another.

"2. That the wards should be *only one story* in height, and be ventilated by openings along the ridge of the roof.

"3. That the ward pavilions should be put up not to remain for generations to come; and that when once they are infected, they should be destroyed, and replaced with entirely new structures."

The essay is appropriately illustrated with numerous diagrams and plates; and, as a concise history of the origin, utility and progress of hospital construction and appointments, both civil and military, we commend it as a work of much practical utility.

Hay-Fever, or Pollen Poisoning,* is a title which expresses the faith of the writer in *pollen*—sharpened by many years' suffering—as the specific cause of hay-fever. This the writer demonstrates by a cogent statement of the history of the disease, the circumstances under which it prevails, and the only effectual treatment for its relief—banishment, for the time being, from the scope of pollen dust, particularly that which is scattered by the *ambrosia*, which the author regards as the most common and the most widely diffused of all causes.

Public Hygiene and State Medi-

*An essay read before the New Jersey State Medical Society, by Elias J. Marsh, M.D., of Paterson, President of New Jersey State Board of Health. Reprint from State Society Transactions, 1877.

cine* comprehends a brief history of the progress of sanitary science since the English enactment of 1848, the sluggish following and short-comings in this country, and the importance of a National Health Council, with "a Secretary of Health—a member of the Cabinet—and the peer of all the Secretaries," which the author thinks should be established without further delay. "To execute the entire system or machinery of sanitary laws and hygienic regulations, a large number of scientific and faithful officers of the government are absolutely indispensable, and these can only be justly provided and sustained at the expense of that public to whose cause and for whose benefit they are to devote and exert their every talent."

The International Review—new volume and new year—opens brilliantly. The *January–February* number contains contributions from America's best-loved poet, Whittier; her trusted statistician, Wells; her Congressional biographer, Major Ben Perley Poore; England's most renowned historian, Freeman; England's highest art-teacher, Hamerton; Germany's greatest philologist and Hellenist, Curtius, and her learned constitutionist, Baron F. Von Holtzendorff; the distinguished Southern Representative, Alexander H. Stephens; the well-known Italian, De Gubernatis, and Herbert Tuttle, of Berlin; Caspar René Gregory, of Leipsig; M. Nongaréde, of Paris; George Barnett Smith, of London; Professor Sumner, of Yale; Dr. Samuel Osgood, Dr. John Hall, Charlton T. Lewis, and others of New York and elsewhere. Ir range of subject it is equally international, and in interest universal.

As the "**International**" invariably comprises literary material not accessible elsewhere, $5.00 cannot be better expended than in a subscription for it. Copies may be found at the booksellers and newsdealers, where future numbers may be subscribed for.

Economical Homes for the Working Classes.—At the November meeting of the New York Municipal Society, the following resolution was adopted:

Resolved, That a committee be appointed to consider and report what measures can be taken, by the aid of new legislation, or otherwise, to facilitate the creation and sale of building lots in this city of a convenient size and shape less than 25x100, for the building thereon of houses most suitable for the occupancy of those of the most limited means who are able to buy or rent an entire house; and what are likely to be the pecuniary and social results of building on such lots.

The following committee was appointed:—Dr. Stephen Smith, Chairman; C. L. Brace, Cephas Brainard, Dwight H. Olmstead, F. W. Cossitt, A. C. Hoe, F. H. Draper, C. Pfeiffer, E. Van Valkenburgh.

The Illustrated Annual Register of Rural Affairs for 1878* is one of the most useful of annuals published. Besides the calendar pages necessary to every household interested in keeping apace with old Father Time, it has over a hundred illustrated pages of agricultural, floricultural, farm-house and dairy reading matter, and a variety of other useful matter.

Broiling without smoking, and with perfect freedom from ashes, is the special virtue of *Cornwall's Patent Broiler*. It is a sort of *corrugated* frying-pan, by which contrivance the heat is distributed under the meat quite as effectually as over burning coals. It can be used over hard or

*Report of Committee made to the Medical Society of California, 1877. By Joseph F. Montgomery, M.D., of Sacramento, Chairman, Member of California State Board of Health, etc. Reprint from Transactions of the State Medical Society of California, 1877.

*Sent by mail, postage paid. Single copies, thirty cents; eight copies, $2. Prices por 100 or 1,000, sent by express or otherwise at expense of purchaser, will be given on application. Luther Tucker & Son, Publishers, Albany, N. Y.

soft coal, or wood fires, or simply on the range or cooking stove; and if due care be observed not to have the broiler too hot, the meat will be thoroughly broiled, while all its juices are retained in perfection. George Cornwall, Patentee and Manufacturer, 18 Warren St., New York.

The Philosophy of School Discipline* is the title of a brief paper before us, which had better been called the ethics of the school-room, inasmuch as it comprehends the relations of the district as a body politic; the parents and guardians, the children and the teachers—upon all of whom rests certain obligations essential to the maintenance of good discipline. The relations of these several dependences are briefly defined and their interdependence shown. Success in the effort, the author holds, depends upon the power of the teacher to detect—to make a good diagnosis of—which part of their organic whole is out of order, and to apply the corrective accordingly.

The paper is an excellent one, worthy of a wide circulation, and the diligent reading of all the parties concerned, particularly teachers.

The Department of Agriculture is, and will long be, remembered as one of the most signal triumphs of the Centennial, and the Report of the Commissioner for the Centennial year, now before us,† admirably summarizes the exhibit in an attractive volume of 450 pages, which cannot fail to be of interest to the whole country, and which therefore eminently deserves a wide distribution. Besides the Reports of the Commissioner on the general subject of Agriculture, Entomologist, Chemist, Botanist, Statistician, Microscopist and Superintendent, there are miscellaneous papers on: Relations with South America, Agriculture in Italy, Agriculture in Spain, Jute Culture, Salt and Fresh Water Marsh Hay, Cattle-feeding, Fresh Meat Shipment to Europe, Rinderpest, Recent Inventions for Insect Destruction, Progress of Industrial Education, and Digest of State Reports.

"Public Health."—It is with sincere regret we learn from the number for December 28th that it "is the last." The first number of *Public Health* was dated May, 1873, only one month later than the first number of THE SANITARIAN. It has been our most valued contemporary; the one from which we have learned soonest and most of the progress of public health in England in particular, and of a wide field of English State Medicine in other countries. And right sure are we that the discontinuance of *Public Health* is not due to any lack of editorial ability, or failure to command contributions of a high order. In both these respects it has been a signal success. And yet, according to the announcement of discontinuance, it did not meet with the expected amount of encouragement—*why*, we are only left to conjecture.

Books Received.—Bowditch's Hygiene in America; St. Louis Public School Report; Woodman and Tidy's Forensic Medicine and Toxicology; Garland's Pneumonia-Dynamics; Character—Edward Hammond Clark; Le Conte's Elements of Geology; Illinois State Medical Register, 1877—78.

*A paper read before the meeting of the New York State Teachers' Association, July 25th, 1877. By John Kennady, Buffalo, N. Y.

† Report of the Commissioner of Agriculture of the operations of the Department for the year 1876.

Special Report, No, 1: Statement showing the Condition and Prospects of the Cane-Sugar Industry in the United States, pp. 41.

Special Report, No. 2: Statement showing the Condition of Crops. And also the International Wheat Supply and our Wheat Exports, together with Foreign Crops and Prices, pp. 35.

Washington: Government Print.

GARDEN CITY—NORTH SIDE.

THE SANITARIAN

A MONTHLY MAGAZINE.

Vol. VI. MARCH, 1878

VENTILATION.

From advanced sheets of a paper written for the Maryland State Board of Health, 1878

By W. C. Van Bibber, M.D., Baltimore, Md.

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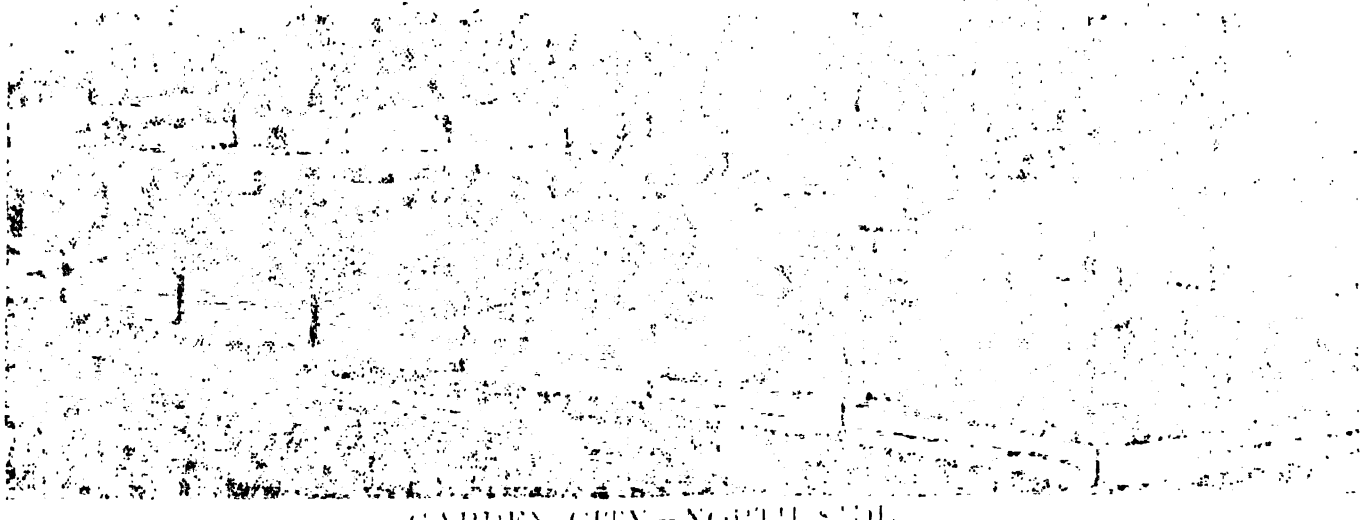
If I could make ventilation practical, and display the wealth of subject to the humblest and most unscientific classes, as well as the more refined and educated, it would amply repay me to turn for a time from the routine of my profession and become a laborer in this work of reform. No man has a better right to know to plead for the necessity of ventilation than the physician; and no more deplores hurtful consequences when his explanations suggestions are unnoticed.

The subject of ventilation, although as yet imperfectly understood, is commanding more and more attention; and there never was a time better suited than the present to test what is new as truth in the matter, and, by recording experiments made, become the imperious authority of private judgment. To [illegible] this, there are now a few earnest men scattered over the [illegible], who, with the limited means given to them, have shown capacity, and are, by occasional publications, evidently in the interest in the subject. This is exactly what a so-called "practical men need; and when this [illegible] appeal further penetrates into the minds of those who [illegible] springs of public opinion, and are in position to favor [illegible]



GARDEN CITY — NORTH SIDE

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A plea for ventilation is needed, and if cause be shown why, one point will be gained towards accomplishing the desired result—an attempt at improvement. In order to explain the subject, it will be proper to (1) show what deficiencies exist; (2) the nature of the evils which result from a want of proper ventilation, and afterwards to point out some reasonable means for remedying these defects. Just as a physician, after he has announced the name of a disease, explains its nature, and then proposes some feasible plan of alleviation or cure.

If I could make ventilation practical, and display the wealth of the subject to the humblest and most unscientific classes, as well as to the more refined and educated, it would amply repay me to turn aside for a time from the routine of my profession and become a teacher in this work of reform. No man has a better right to know or to plead for the necessity of ventilation than the physician; and no one more deplores hurtful consequences when his explanations and suggestions are unnoticed.

The subject of ventilation, although as yet imperfectly understood, is commanding more and more attention; and there never was a time better suited than the present to test what is now taught as truth in the matter, and, by recording experiments made, to overcome the imperious authority of private judgment. To accomplish this, there are now a few earnest men scattered over the country, who, with the limited means given to them, have shown great capacity, and are, by occasional publications, evidently increasing the interest in the subject. This is exactly what a large class of "so-called" practical men need; and when this is done, and the appeal further penetrates into the minds of those who hold the main-springs of public opinion, and are in position to facilitate

the practical application of principles which need demonstration, then there is no doubt the seed which has been sown will bring forth an abundant harvest.

It is the object of this paper to deal with the subject practically. The word ventilation is derived from the Latin word "ventilo": "To fan with wind; to open or expose to the free passage of the air or wind; to cause the air to pass through." The object of its study is to insure for all classes better ventilation, better personal health, and more regard to domestic cleanliness.

It is well to commence any attempt at advancement by showing in the very beginning the cost of what is offered. To do this concisely, an extract is taken from Mr. W. F. Butler's paper upon "The Ventilation of Buildings." He says: "Before I leave this part of my subject, I will mention one other difficulty in the way of ventilation, and this by no means a small one—I mean the cost. Although efficient ventilation will not cost a very large sum per room, it cannot be denied that somewhat will be added to the expense of the house, and this 'somewhat' the speculative builder never will add until he finds that intending tenants and purchasers refuse to take houses which are not properly ventilated.

"As with houses, so with other buildings and works; if we make up our minds to ventilate them, we must also resolve to pay for it.

"I fear that even persons who build houses for their own occupation are but little in advance of the speculative builder, as far as any recognition of the absolute necessity of efficient ventilation is concerned. Many hold to such crude devices as open windows and doors, others think a hole of any size or in any part of the wall quite sufficient, while, I believe, a majority pooh-pooh the whole question.

"It then becomes the duty of scientific men, and bodies, to educate the public up to the recognition of the fact that ventilation is every whit as important as drainage to individual houses, and that man can no more live in a foul atmosphere than he can while constantly drinking poisonous water.

"Ventilation is a want arising chiefly from modern ways and customs, and is, therefore, a comparatively new branch of science, and we owe our present knowledge of the subject especially to modern researches and discoveries."

During the reign of Queen Elizabeth it was customary for a host to apologize to his guest if the apartment was not provided with a chimney. Before that period mankind lived more in the open air than they do now. So greatly do habits, customs, and times change. If I had space to relate the experiences of Dr. Desaguliers, who was active in the subject of ventilation early in the seventeenth century, it would be seen that the work of a reformer was even then harder than now; and it has always been a fact that any attempt to show fairly what is the true interest of a community at some particular time is met by conflicting personal interests, and other difficulties, the full extent of which will only be known and appreciated in the future.

In this paper, calculations, figures, and the scientific nomenclature

have been avoided as much as possible; and it was at first intended to adhere strictly to the one subject, *ventilation* proper; but warming in winter, cooling in summer, and drainage at all times are so intimately connected with it, that it is impossible, in a popular paper, to treat of the one without alluding to the others also.

Of the Fundamental Principles of Natural Ventilation.—The one general and great principle of all ventilation is to keep the air in motion; to create a small wind, as the word implies. Without this motion there can be no ventilation, and in places and situations where the air is held still by artificial obstructions, or where, at a high temperature, it remains at rest, there is no real health.

If even a clean house or room, built moderately air-tight, be kept closed for a time, on going into it from out-of-doors, where the air is in motion, one will immediately find a change in the atmosphere, and perceive that it "smells close." The effect which an absence of motion has upon air may be illustrated by referring to the changes which a similar condition produces upon water and animal food. Rain-water or river-water, if kept at rest, as often happens, in pools or ponds on vacant lots around cities or towns, or in extended marshes along level river-courses, becomes stagnant; and flesh, after a time, becomes tainted, when there is no longer a blood-motion through it. All these conditions are detected by the sense of smell, and all of them are injurious to health. In what order or proportion are they injurious? This question is not often asked, and in all fairness, it must be admitted, its true answer depends on a number of circumstances. Yet a few well-known facts in this connection will show the urgent necessity for pure air. The longest period of time upon record in which a man lived without food and water is about fourteen days. If water be given, but no food, life may be sustained longer than this; but deprived of air, human life will be extinguished in three minutes. This serves to show, in one way, and in a prominent manner, the high value of ventilation. Human life may be continued for a time by bad air, stagnant water, and decaying food; but without pure air, good water, and wholesome food, life soon loses all its freshness. Most persons make great exertions to obtain good water and sound food; but, unfortunately, there is not often the same regard paid to the condition of the air. Is ventilation then of no importance? Should it not be studied by the statesman and the philosopher as well as by the physician?

Again, it is a common expression to say "a close day," when there is but little motion in the air. This happens as an atmospheric phenomenon less frequently in hilly and mountainous lands than where the country is level. Topography has much to do with the general motions of the air. So that house-sites, yards, barns, and fields are differently ventilated or affected by the winds—some too little, others too much. This fact is generally known to farmers and countrymen of experience, who find it greatly to their interest to act upon it. But when the principle of motion in the atmosphere at large is more studied, it may account for the produc-

tion of malaria in certain situations and seasons. This probable effect may be thus explained:

It is well known that fever and ague and remittent fever are common in the flat lands bordering along the Chesapeake Bay, and in the level valleys of fresh-water rivers almost everywhere throughout the earth. In such localities, during the months of July, August, and September, there are many days when there is no ventilation, because there is but little horizontal motion in the atmosphere at large. The range of the thermometer during these months, even in this climate, is high during the day, and the water in the marshes and swamps, being perfectly still and exposed to the ardent rays of the sun, is heated, and gives rise to the formation of copious vapors. It is then that the motionless air, resting upon the stagnant and vaporing waters, becomes impregnated with the poison of malaria. It is then that this poison produces such ill-health amongst the resident population. Some of the reasons for believing this explanation to be correct are, that the known factors for the production of this kind of malaria are valleys and marshes, stagnant water, hot weather, and the plane of atmosphere not extending to a great elevation above tide-water. Long experience has proved that some seasons are more sickly than others, and that some situations, even in close proximity to each other, are more affected by malaria than others. These differences are to be observed sometimes during wet seasons, and sometimes during protracted droughts; sometimes when there is a rank vegetable growth, and again when this is by no means remarkable.

Another fundamental principle of natural ventilation is, that cold air is known to be heavier than warm air. It is by the inequalities of heat distributed through the atmosphere that cosmical ventilation is effected. This is the cause of the trade winds, and of all winds, both of the upper currents and the lower currents. Within a certain height of atmospheric space cold air obeys gravitation and comes nearest the earth; warm air ascends. This principle lies at the bottom of the subjects of warming and ventilation, as well as any system of ventilation for summer or winter established within "definite sections of infinite space," such as dwellings, public buildings, and ships.

Another principle of ventilation largely connected with this part of the subject is the diffusion of gases, or "the theory of agitation," as it is called by some writers. The meaning of this term is, how and by what laws do different gases mix and commingle with each other in the air?

Whilst preparing this paper, I received a letter from a gentleman, from which I make the following extract: "I will now concisely and candidly tell you what puzzles me on this subject, so that you may strive to make it clear in your paper. I understand how and why warm air ascends. But how can carbonic acid gas, which is heavier than air, be made to ascend with it? When I was in Italy I saw a dog go into convulsions when held above what is called the 'Grotto-del-cane,' whilst the spectator could stand above the dog with perfect impunity, because the miasmatic exhalation did not ascend so high. How will you get your heavier gas *up and*

away? I know the masters of ventilation profess to be able to do it, and I believe they can, but your readers would like to understand the *how?*"

The weight of air being taken as 1, the weight of carbonic acid gas is 1.52901, showing it to be more than one-half heavier than air. But the expansive force of carbonic acid gas, when heated, is greater than that of air. When the breath leaves the nostrils the whole of it ascends, not only because it is warmer and lighter, but because the outer air is colder and heavier. This latter, by its expansive force, pushes the breath up and away—out of reach—before the next respiration. But as the breath cools, and the carbonic acid gas cools with it, this latter separates and falls. If the breathing happens in the open air, in the country, the carbonic acid gas falls towards the earth and the shifting winds scatter it through the atmosphere, there to resume its normal proportion. But when the breathing happens in an occupied room, or a crowded hall, the carbonic acid gas will fall towards the floor by the same law, provided there be no upward current in the room to prevent.* Now, how and where this upward current shall be established is exactly the point of discussion of the practical men of the present day. With us, Mr. Winans, and Mr. Neilson, the architect of the Academy of Music, establish the current from below upwards and carry the damaged air up and directly out of the top of the house. The architect of the Cook County Hospital, of Chicago, and a number of others, draw the air by suction from a point near the floor, after the carbonic acid gas is supposed to have fallen, and thence carry it away by different contrivances, some more complicated than others. It is a matter of importance to establish some law regulating the ventilating current out of a building, because the object in view is to introduce certain definite quantities of pure fresh air into each occupied apartment, in order that it may be mixed with that which has already been damaged, so that a healthy and comfortable atmosphere may be maintained. "The theoretical perfection of ventilation is to render it impossible for any portion of air to be breathed twice in the same building." How does nature accomplish this under the dome of heaven? In the open air the ventilation is perfect, because the breath, as it leaves the body, has always a higher temperature than the air. With a mean temperature of 54° F., each individual has to warm a gallon of air every minute about 44°, since the average temperature of the breath is 98°. The least expenditure of power for carrying away the noxious air is to bring in a fresh supply from below, and hence the upward current, established by a proper opening at the top of the house, is the most simple, efficient, and economical.

What damages the air in an occupied dwelling or room? The breathing and cutaneous exhalations of its occupants, the air from heaters in winter, house dust, the air from neglected

* This is explained in another way and at greater length in the *Architect* for 1850, and in the "Encyclopedia of Useful Arts," article, "Warming and Ventilation." Mr. Robert Briggs in his paper "On the Relation of Moisture in Air to Health and Comfort," thinks that the injurious effects of carbonic acid gas in crowded rooms has been exaggerated.

[illegible]

[illegible] Cambridge, Frederick, Easton, [illegible], Westminster, and other towns of our [illegible] throughout the country, are wise, they will learn from this example. From their very beginning such towns have suffered much from the way in which the yards were enclosed in the first place, and the slovenly manner in which they have been kept since. Should any of these corporations promptly act upon this idea, and remove the board fences from around their yards, they will not only more surely secure the pure air with which their houses may be ventilated in summer, but, besides this, they will add beauty and elegance, healthfulness and cheerfulness, to their homes.

Another principle of natural ventilation bearing on this subject may be mentioned, viz., that obstructions built upon the surface of the earth prevent a free circulation of the lower strata of air. Obstructions, in the form of houses, constitute cities, and, of course,

must exist wherever a city is built; but in modern cities the streets should be wide and made to suit drainage. Narrow streets and alleys in older cities should be widened, and the board fences, which obstruct surface ventilation, on account of their unsightly appearance, together with the filth which they hide, should be substituted by a low iron rail or a curb. Of what use are these board fences now in large cities? Formerly they were built to encircle the *temples of cloacina*, which were most conspicuously erected at one end of their enclosures. These temples are now elevated to a position of one of the household penates in the better classes of houses in large cities, and should be most plentifully supplied with water or dry earth. I know a certain flower-garden, I need not mention in what village or city, which, at the proper season sends forth a most delightful perfume, were it not for a particular building which stands in one corner, and which, not having any care devoted to it, and being totally destitute of all appliances of deodorization, completely neutralizes the fine aroma of roses and jasmines. At a very trifling cost, and with very little trouble, particularly as the owner of the establishment happens to be a carpenter, all this source of annoyance might be avoided, and both the passers-by and the residents of the house might enjoy fragrance unmingled with fetor. This is only one example out of many. Beauty, cleanliness, healthfulness, and security would be increased by the removal of the fences around the yards, and it is not an unimportant matter, because the many small yards thus fenced off make an immense aggregate surface. If the curbstone was made equal to a fence by statute law, the open yard system would be more secure as well as more cleanly and beautiful.

Akin to yard ventilation is park ventilation, of which most cities and towns have far too little. Before leaving this part of the subject, those living in the country must be cautioned about surrounding their houses too thickly by cedars and shade trees. Many of the older improved houses in this State are made damp and unhealthy from this cause. Two instances may be mentioned in illustration from my own personal knowledge. Clifton Park, the country residence of the late Johns Hopkins, was so closed in by a variety of trees and shrubbery that the light breezes of summer could not penetrate to the house. Belleview, the former residence of George A. Reinicker, Esq., was in the same way. The houses were damp, and the atmosphere rendered close and unpleasant. Mr. Thomas Deford has told me of a country house which he knew to be notoriously unhealthy from this cause and neglected drainage combined, and which, since these two causes have been removed, is now a valuable and healthy residence. Nothing could be more beautiful and sensible than the manner in which the elegant oaks are trimmed high from the ground around the Deer Park Hotel, in Garrett county. Here the currents of air are not only unimpeded, but the flitting shades give inequalities of heat, which invite the air to constant motion.

A Few of the Practical Details of House Ventilation.—The estimated number of houses in the city of Baltimore is

80,000. I have not met with any collected statistics showing the whole number in the District of Columbia and State of Maryland; but, calculating five of the population to each dwelling, will give the dwellings in round numbers for the State and the District at 180,000. It is probable that this estimate is short of the actual number. All houses require ventilation in some way, and in a particular manner according to the purpose for which each house is intended to be used.

Second to the dwelling, it is the interest of men to ventilate the stabling. "There is no art of greater importance than ventilation," says Mr. Tomlinson; "for on it depend the health, the comfort, and much of the prosperity of man, and of the animals which he domesticates for his use and profit."

Pure air is wanted for house ventilation, and to obtain it the premises around all houses must be drained and kept in a cleanly condition, whether it be in cities, in towns, or in the country. There is no use in changing even the already damaged air in a house for a worse article; and on this account, like every other exchange, ventilation requires study and judgment.

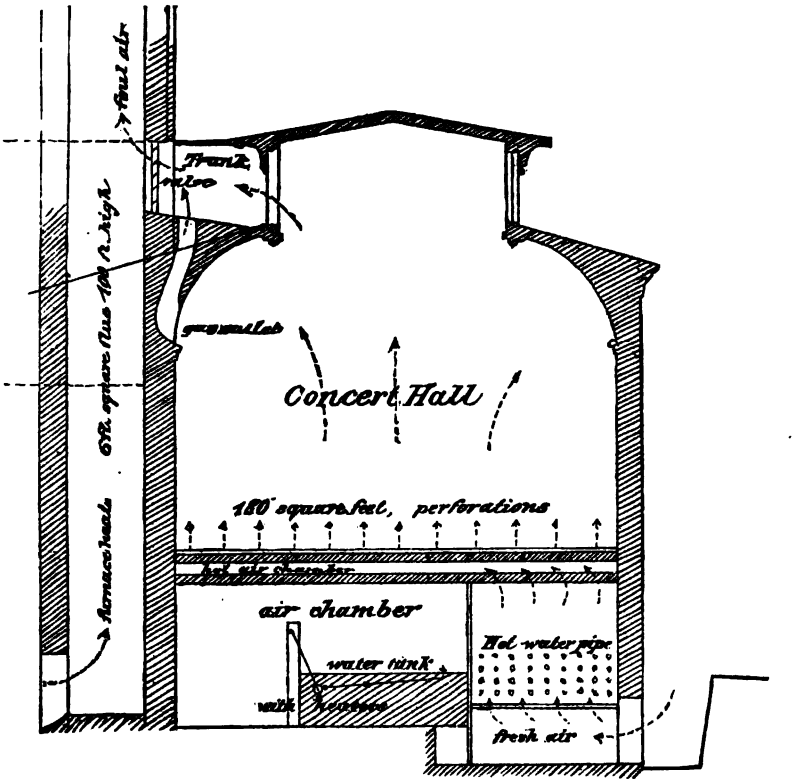
The first question, therefore, to be asked is: Where can good air be obtained? Most of the public buildings now under construction in Baltimore are being built with a view to their ventilation, thanks to the study of the subject by competent architects. The earnest gentlemen now engaged in the construction of the Johns Hopkins Hospital are giving the subject the most minute attention. Let no man say the task is not a large and difficult one.

It is generally supposed to be an easy matter to ventilate a dwelling-house or a single room; and so it is; but to warm and ventilate them properly is not an easy matter. And if it is not an easy thing to warm and ventilate a small dwelling, or a moderate sized chamber, how much greater is the difficulty for a large apartment intended to hold hundreds of breathing men and women? All honor to him who shall accomplish such an undertaking in any community. Neither talents nor means have been spared to perfect the ventilation of the two Houses of Congress in Washington, and also many other large public buildings in that city. The results are not yet satisfactory, but the students of the subject are not discouraged.

It has been said, by those who should know, that the best ventilated private house in this country is in Baltimore. It is the residence of Thomas Winans, Esq., with whose permission an outline illustration is here given from a drawing by Mr. Neilson, intending to show the manner of warming and ventilating his concert-room. This same principle shown in the illustration is used, as a general thing, throughout the entire house; but in detail, almost every room has some contrivance especially adapted to its peculiarities. It will be seen by the drawing that the exhaust or ventilating stack for the building is six feet square and one hundred feet high. Those who have practically dealt with the subject will immediately see the large extent of the appliances used from this one measurement alone.

A few nights ago three physicians were seated in the gallery of a

new church in Baltimore, hoping to hear the eloquent instructions of a distinguished pulpit orator. The congregation was large, and those



PARTIAL SECTION OF MR. WINANS' CONCERT HALL.

who sat in that gallery nearly two hours had more zeal and endurance, but less prudence, than the physicians. Some of those who did remain suffered terribly for it afterwards. Can any rational person suppose for a moment that a mephitic atmosphere is at all conducive to a religious feeling? I know an eloquent clergyman in this State who, when catechising the children in the church on Sunday afternoons, gave orders to lock the doors and let no one out until the whole congregation was dismissed. An attendant upon this service, on one occasion, fainted in the church, because he was prevented from getting out of the building and its vitiated atmosphere; and yet this clergyman is a most pious and noble-hearted man. It only requires a thought, or a suggestion, to turn him into an able advocate of proper ventilation. Such occurrences as these, in conjunction with knowledge, wealth, and present advancement, are certainly inexcusable. That minister, that public officer, or individual owner, who has knowledge, power, and means at command, should deal fairly and justly with those who enter their edifices. Although many persons fully appreciate the value of ventilation,

and avoid those buildings which are imperfectly constructed in this respect, yet it must be confessed a large majority are negligent.

The predominance of people in the lower walks of life who are unfamiliar with sanitary laws claim special attention from those who have more knowledge, and particularly from the conservators of health in the interest of the government. It is, of course, mostly in behalf of these, because they are the most numerous, that this paper is written. The ventilation of their houses and premises is becoming more and more a modern necessity, and at once appeals to the self-interest of every individual. The late Dr. H. W. Dean, of Rochester, says: "Obviously no one system or plan of ventilation can be made to meet all cases. Medical men well know that the infectious causes of disease remain in the houses of this class of people, and when developed, extend to other and more salubrious districts; then the evil is recognized and fully appreciated. The great majority of epidemics originate in these localities; the various causes of disease, nursed in damp cellars and apartments, which remain unventilated during the winter, cannot be destroyed by the better ventilation and warmth of summer."*

Females, children, and invalids are, upon an average, during the winter months, from twenty to twenty-two hours of each day in the house, and from five to nine hours in one sleeping apartment; hence the value of house ventilation. Notwithstanding this, most of the houses now under construction in the State are not supplied with proper means of ventilation:

"Ordinance 48, Section 8, 1850, for the city of Baltimore, enacts that no flue or chimney shall be built less than thirteen inches square in the clear, where wood is to be burned. Ordinance 38, Revised Statutes, January 7th, 1869, enacts that flues or chimneys may be built eight inches square in the clear, where hard coal is used." This was one step in house-building economy made in the interest of the speculative builder, and not in the right direction for house ventilating purposes. The proper art of constructing fireplaces and chimneys is fast becoming a lost art, and this is another step in the wrong direction. Those whose business it is to supply the means of warming buildings, and with this some method of ventilation also, complain that they are not permitted to do all they wish for the comfort of such dwellings in winter on account of expense, although the outlay asked may be comparatively small. This is a point which ought to command more attention than it does, and, in fact, is the gist of the whole of this part of the subject. A good heating and ventilating apparatus for an ordinary dwelling can be obtained, if one is willing to pay for it. Economy in the item of good air is a most false economy. If man cannot live three minutes without air, it is a close inference at least to say that bad air must be injurious.

As the manner of ventilation differs for the two seasons, it may be proper to make practical suggestions concerning some economical means of ventilation for both summer and winter.

(*To be continued.*)

* "Transactions of the Public Health Association," vol. ii., p. 329.

GARDEN CITY.

By A. N. Bell, M.D.

Written for the American Public Health Association, Chicago, September 27th, 1877.

This new city is situated on a sandy plain, one hundred and three feet above the level of the sea, about fifteen miles from the City Hall of Brooklyn. The region of country round about, from the time of its first settlement by Europeans, appears to have been regarded as very remarkable.

The Hon. Gabriel Furman, in an address before the Agricultural Society of the county in which Garden City is situated (Queens county, Long Island), in 1844, after quoting the earliest printed histories of the New Netherlands, as New York was called previous to 1664, states that there was scarcely a traveller of any note that visited this part of North America who does not mention these "plains," and regard them worthy of description. The Rev. A. Barnaby, who travelled through the middle colonies in 1759, visited them in July of that year, and speaks of the great interest manifested by the inhabitants of New York at that period in reference to "*The Plains*," and observed that strangers are always carried to see them *as a great curiosity, and the only one of the kind in North America.* "This last remark," says Judge Furman, "which now appears singular to us, was then true in reference to the knowledge possessed of the interior of the continent; the immense plains or prairies of the far West were then unknown."*

The whole extent of this Long Island prairie comprehends about sixty thousand acres, and the portion known as "Hempstead Plains," about seventeen thousand. Garden City comprehends a little upwards of ten thousand acres of the highest ground, bounded on the south by the village of Hempstead, and on the north by Mineola; each distant about a mile from Garden City Hotel.

Beyond these villages, over insurpassably fine roads, *via* Hempstead and several intermediate places of interest, to the Ocean Beach, is about seven miles. On the other side, to the estuaries of

* From an Address by Dr. E. F. Peck, before the Farmers' Club. "Transactions of the American Institute," 1847, p. 690.

Long Island Sound, Roslyn (the picturesque home of William Cullen Bryant, Park Godwin, Hon. Thos. Clapham, Stephen Tabor, General Ward, and others), is six miles distant. And within a few miles further on, Great Neck, Little Neck, Sea Cliff, Glen Cove, and many other places noted for their beauty and picturesqueness. Creedmoor, which has so recently attained a world-wide fame, is distant only four miles by boulevard, or fifteen minutes by rail; and by *rail*, indeed, the whole of Long Island is at the feet of Garden City: a dozen or more lines a day, from Coney Island to Montauk, communicating and intersecting with twice as many more to and from New York and Brooklyn, and all intermediate places.

A remarkable circumstance in the history of Hempstead Plains is, that for a period of nearly two hundred years, until—since the time of Mr. Stewart's purchase—eight years ago, the whole region was regarded as *barren;* not worth the effort of an experiment for cultivation. But against this idea Dr. E. F. Peck now a resident of Brooklyn, has contended, almost alone, for forty years. In a letter to THE SANITARIAN, under the caption of a "CITY OF HEALTH," in May last, he gives the following concise description of the place: "It is an elevated table-land with a southern aspect, with a descent of about twenty feet to the mile. It is bounded on the north by the high ground or ridge of hills running through the island from west to east; with this regular and gentle descent to the southern shore of the island, the under drainage is most complete and perfect. Then the surface of the 'plains' from west to east is gently undulating, in long swells, elevations, and depressions, and these depressions, looking southwardly, have exactly the appearance of the dried bed of streams; and following them down towards the south borders of the 'plains,' streams of purest water are found in many of them.

"These rollings or undulations of the land present, in fact, three drainage surfaces on each of them—one southerly, of about twenty feet to the mile, and one on each side, gently sloping to the west and to the east from the centre of these elevated sections—thereby presenting a most wonderful natural drainage. The surface soil is a dark loam, from fifteen inches to two feet in depth. It looks just like what a lady would select to fill her flower-pots with; and is highly productive, and on which grew and grows the 'very fine grass that made exceeding good hay,' according to the old chronicle (Denton); and what is remarkable, this grass never runs out—it is always fresh and green. And it may here be remarked that the natural grasses of Hempstead Plains are the most nutritious grasses that can be found in the Northern States.

"The turf upon this upper and dark soil is so thick and strong as to require a team of three horses with a strong plough to turn a furrow through it. Under this layer of dark loam is a layer of yellow loam, of about equal thickness, in many places a clay loam or clay; and under these at a depth of about two feet and a half or three feet, is the firm, compact gravel and sand that everywhere form the main body of Long Island, for it is literally a 'child of the ocean.'

"These under sands and gravel are firm and compact (there are

no quicksands), and intermingled with fine silicious sands, comminuted, almost levigated, forming the most complete and perfect filter that can possibly be made; and the water found under this whole region, and flowing out of it, is of the purest and sweetest kind, and never fails. . . . The climate is the finest in the State of New York, most healthful and pleasant. There are no stagnant waters nor malarious lands within miles of this highly favored and most interesting region. There is no place like it for a city of health; the great work has been done by nature."

This letter of Dr. Peck attracted wide and deserved attention, and elicited much inquiry. Among the rest was the following communication on the *soil, site, and status* of Garden City, from Mr. Elias Lewis, Jr., one of the most distinguished amateur geologists of Long Island:

"The most striking sanitary features of the place are: an inexhaustible supply of the purest water, the perfect conditions for subsoil and surface drainage, and, consequently, total absence of malaria and of the causes which produce it. With these conditions, and a climate tempered by the contiguous ocean shore, the Old Hempstead Plains, under intelligent cultivation, are rapidly assuming features of utility and beauty, and must eventually become immensely important as suburbs of Brooklyn and New York.

"The water supply of the region is wholly from rain-fall, the average of which is about forty-three inches a year. It has been estimated that three fourths of this sinks into the porous soil. The surface waste is certainly small, and occurs in winter, when the ground is frozen. The subsoil which holds the water is clean silicious gravel and sand, and free from aluminous and calcareous matters. In the progress of the work in founding this new city there is not a single instance where decayed or decaying organic substances have been found in the soil. The soil deposit is in layers, the beds having a dip southward or towards the ocean, the total depth being at least seventy feet. It is probably much more in places. Six miles southward the depth was found to be sixty-eight feet, with a deposit of compact blue clay underneath. At Garden City a dense crust or 'hardpan' was found, by boring through the gravels, at seventy feet below the surface.

"The beds of sand we are considering are evidently formed of the bolder drift of which the island is composed, disintegrated and ground to sand and gravel by waves of the ocean during a period of coast subsidence. These sands now constitute a vast reservoir of water from rain-fall more perfect than any which human ingenuity has contrived. Wells sunk into the saturated sands are inexhaustible. The one at Garden City is fifty feet in diameter, the surface of the water in it is twenty-five feet below the general level of the 'plains' at the place where it is located—in a valley fourteen feet below the general surface—so that the depth of the well or reservoir, to the surface of the water, is only eleven feet. The depth of the water is twenty feet, and rises from the bottom; none gets in through the sides of the reservoir. Water is conveyed to all the houses of Garden City by the Holly system, the pump being adequate to discharge three million gallons a day.

"The enormous volume of the water supply will be appreciated from the fact that in constructing the reservoir two* wrecking pumps, discharging through pipes ten inches in diameter, were worked continually day and night for a whole week in order to lower the water sufficiently to proceed with the work.

"According to the observations of W. R. Hinsdale, Esq., the thoroughly competent manager of the Garden City site, the surface of saturation in the soil has a slope southward, or towards the ocean, of eight feet to the mile. This is less than that given in the original surveys for the Brooklyn Water Works by about one third. But the result stated in the survey, twelve and a quarter feet to the mile, was from an average of many observations over a very wide area. The slope of the surface is not uniform, but undulating between twelve and twenty feet.

"At various points southward of the 'plains,' the water breaks out, forming streams, into the valleys. In a distance of fifty miles along the south shore of the island there are no less than sixty of these spring streams flowing into the bay, and some of them are utilized in the water supply of Brooklyn.

"From the fact that the level of saturation at Garden City, and over the entire 'plain' district of Long Island, is many feet above tide-water, there occurs a ceaseless movement of the water in the soil—slow, indeed, but persistent—which will flow on so long as clouds drop in rain upon the region. And thus it happens that the entire volume is constantly in motion, never stagnant. The quantity which falls upon the ground is immense. Forty-three inches of rain-fall is more than three and a half cubic feet upon a square foot of surface. For convenience of calculation, let us assume that three feet penetrates the soil. This would give more than eighty-three millions of cubic feet upon a square mile, or two and a half millions of tons. A freight car will carry ten tons. Two hundred and fifty thousand cars, therefore, would be required to convey the rainfall upon one square mile in a year. It is easy to see that the volume in the subsoil reservoir is immense, while the waste by streams is enormous; but the supply is adequate.

"The level of saturation in the soil varies but little in a year. It is certain therefore that the entire volume of water, excepting that which is lifted by evaporation or absorbed by vegetation, is steadily and incessantly moving towards the ocean; not in the form of a subterranean stream or river, but in entire mass.

"From the facts stated, the conclusion is evident that the conditions both in the soil and upon it do not permit of stagnant water. There is no such thing as a stagnant, fetid, or malaria-breeding swamp or slough on the whole area of the Stewart purchase, and the same is true of an area contiguous, vastly more extensive.

"The purity of the soil, and of the water supply of Garden City, is carefully guarded; no sewage is permitted to enter the soil. At present it is discharged into cemented cesspools, and quickly removed. Soon, however, new works will be completed for collecting it in a reservoir, covered by buildings, in which the process of de-

* There were *four*.—Editor.

odorizing will be instituted, and the material, after due preparation, will be used to fertilize the land."*

In addition to this description of present sewerage disposal by Mr. Lewis, it should be stated that all the cesspools now in use are temporary resorts only; they are all ventilated by tubes from just below the traps of the water-closets to the roofs of the houses. The system of civic cleanliness in other respects is perfect and complete. All ashes and garbage being regularly called for from house to house weekly or oftener, removed to a distant place, and rendered to agricultural purposes.

As an illustration of the fruitfulness of the soil hereabouts, and in verification of the foregoing conclusions of Dr. Peck, we have been favored with the following account of last year's product of Garden City farming:

Oats,	14,000 bushels.
Indian corn (shelled),	8,000 "
Buckwheat,	3,000 "
Wheat (peculiarly fine),	700 "
Timothy grass-seed,	200 "
Hungarian grass-seed,	100 "
Carrots,	3,000 "
Turnips,	600 "
Potatoes,	350 "
Hay,	350 tons.
Straw, stocks, etc., housed,	1,600 "
Bricks manufactured,	3,000,000.

Live stock, horses, cattle, and sheep on farm, about 300.

In the same connection we have been favored with:

"CERTIFICATE OF WATER ANALYSIS.

"The sample of water from the works at Garden City contains, in one U. S. gallon of 231 cubic inches:

Chloride of sodium,	0.3577 grains.
Sulphate of soda,	0.0637 "
" potash,	0.0972 "
Carbonate of lime,	0.6727 "
" magnesia,	0.3673 "
Oxide of iron and alumina,	0.0058 "
Silica,	0.5598 "
Organic and volatile matter,	0.5832 "
	2.7074 "

Hardness, 0.91 degrees.
Free ammonia, doubtful trace.
Albuminoid ammonia, none.

(Signed) C. F. CHANDLER, Ph.D."

Compared with a "Report Upon the Sanitary Chemistry of Waters, by Prof. C. F. Chandler, Ph.D." (*Public Health*, vol. i., p. 562):

* From THE SANITARIAN for June, 1877.

PURITY OF CITY WATERS.—*Impurities contained in one wine gallon of* 231 *cubic inches*, expressed in grains.

CITY.	SOURCE.	Inorganic matter.	Organic and Volatile matter.	Total Solids.
GARDEN CITY.....	Well (C. F. Chandler).....	2.1242	0.5833	2.7074
New York	Croton, average for 13 weeks, 1867 (C. F. Chandler)	3.90	0.66	4.56
"	" " " 3 months, 1868 "	3.31	1.14	4.45
"	" " " 6 " 1869 "	4.11	0.67	4.78
"	" May 11, 1871 (C. F. Chandler).....	2.799	0.875	3.674
"	" average for 5 months, Winter, 1871-2 (E. Waller).....	3.934	0.508	4.442
"	Well, West of Central Park (C. F. Chandler).....	38.95	4.55	43.50
Brooklyn.....	Ridgewood, average for 3 months, 1869 (C. F. Chandler).....	3.37	0.59	3.92
Boston.....	Cochituate (E. N Horsford).....	2.40	0 71	3.11
Philadelphia.....	Fairmount, Schuylkill (E. N. Horsford).....	2.20	1 20	3.50
"	Delaware (H. Wurtz).....	2.98	0.55	3.48
Albany.....	Hydrant (E. N. Horsford).....	8.47	2.31	10.78
Troy.....	Hydrant (W. Elderhorst).....	6.09	1.34	7.42
Utica.....	Hydrant (C. F. Chandler).....	5.50	0.96	6.46
Syracuse.....	New Reservoir (C. F. Chandler).....	12.13	1 80	13.93
Cleveland.....	Lake Erie (I. L. Cassels).....	4.74	1.53	6.27
Chicago	Lake Michigan (I. V. Q. Blaney).....	5.62	1.06	6.68
Rochester.....	Genesee River (C. F. Chandler).....	12.09	1.28	13.25
Schenectady.....	State Street Well (C. F. Chandler).....	46.88	2.33	49.21
Newark..... Jersey City..... Hoboken..... Hudson City.....	Passaic River (E. N. Horsford).....	4.58	2.86	7.44
Trenton.....	Delaware River (H Wurtz).....	2.93	0.58	3.48
London.....	Thames (Dr. H. Letheby).....	15.55	0.83	16.38
"	Well, Leaden Hall Street (Dr. H. Letheby).....	90.86	9.59	99.97
Dublin	Lough Vartry, new supply (Apjohn and others)..	1.77	1.34	3.11
Paris.....	Seine, above the City (Bussey, Wurtz, and Ville).	7.83	1.00	8.83
Amsterdam.....	River Vecht (V. Baumhauer and Van Moorsel)...	14 45	2.13	16.58
"	Deep Well, at Keisergracht.....	64.55	4.38	68.93

The dwelling-houses are of wood and brick, not in tall rows of contiguous slender structures, propped up by one another, but commodious two and three-story houses, with large, airy, and well-lighted rooms; abundantly supplied with pure water for all purposes, bath-tubs, wash-tubs, closets, and sinks, plumbed in a workmanlike manner; gas supply and fixtures, dry cellars, plenary ventilation, open fire-places to all, with furnaces in addition to the larger ones, and double windows to many, and all constructed with an eye to beauty as well as to comfort—twin brothers of sanitary science. Each house is complete within itself, there being no back buildings, and, in the ordinary acceptation of the term; no back yards, no rubbish corners. A few exceptions there are in this regard, conspicuous for their rarity and prematurity. But these blemishes bear evidence of being in rapid decline and of short time to live. Moreover, we are glad to be informed they are the last of their race, to mar the healthfulness and beauty of the scene, and that it will speedily be extinct.

The warehouses, farm-houses, shops, and stables are all apart from the dwelling-houses and yards, on a distant by-street to themselves. ne respect, however, they are like the dwelling-houses—con- ted with an eye to artistic effect; they bear substantial evi-

dence of refined taste and concentrated thought on the importance of charming the senses.

In the central portion of the city there is a park of upwards of thirty acres, thoroughly turfed; pervaded in all directions by fine gravel walks; borders handsomely ornamented with rare flowering plants, evergreens, and vigorous young shade trees, refreshed by the spray of numerous fountains from an illimitable supply of pure water. In the rear portion of the park, on the north side, stands Garden City Hotel, a handsome four-story brick structure, conspicuous alike for its beauty, excellent appointments, and admirable keeping. Near the middle, and in front of the hotel, stands the office building, a handsome two-story and mansard structure, in which the manager concentrates all the clerical work of the city. A few rods south of this is the railroad depot, also tastefully constructed of brick, with platforms on a level with the floors of the cars. The only remaining public building on the public park is the gas-house, a small ornamental structure, sufficiently distant from all other buildings to insure safety in the event of an explosion. The park, city, and all the houses are lighted with gas.

All around the public park, and all sides beyond, over an area of one and a half by three miles, are finished boulevards, eighty feet wide—an aggregate length of twenty-seven miles—dividing the city into large rectangular squares, extending into and intersecting with one another and the delightful drives before mentioned. The city squares are again subdivided on all sides by white picket fences into building plots of from half an acre to an acre or more for each dwelling. The dwelling-houses are all set back in the swards, on a building line seventy-five feet from the front of the inclosures. The borders and walks are studded with flowers, hardy shrubs, evergreen and other ornamental trees, and the boulevards, in like manner, are bordered throughout their whole length with thrifty young shade-trees, over *fifty thousand* having been planted since the beginning of the enterprise, and everywhere bearing evidence of the fruitfulness of the soil and the luxuriance of the abode.

Of the Memorial Church erecting—THE CATHEDRAL OF THE INCARNATION—the whole world has heard, for it has become a part of the fame of the greatest merchant prince of modern times—a perpetuation of his memory by his noble widow, who herein shows herself to be a worthy heiress of a munificence to untold generations to come. In the glowing words of Bishop Littlejohn's address at the laying of the corner-stone, on the 28th of June, last, "It will tell to coming time the record of an honest, industrious, and sagacious life; a life without a stain, modest and temperate, just and true, brave and firm of purpose, simple in habits, genial in home life, quiet and humble everywhere, and all this in the midst of transcendent success and riches. But more than this, it will tell of a life that closed its mortal career in the comfort of a reasonable, religious, and holy hope. Here that life, as the years roll on, shall

'Smell sweet,
And blossom as the dust.'"

A description of this structure, in anticipation of its purposed completion in the near future, is not necessary to this paper. It will suffice to state that H.G. Harrison, Esq., is the architect, and that

it will comprehend the best results of sanitary science, consistent with the highest degree of ecclesiastical art and artistic finish.

On this same foundation, schools for both sexes have recently been dedicated; they are as yet only in embryo, but flourishing. And enough of them is known to be sure that, springing from the same general source, they will in due time be borne along as part of the same current, which here moves smoothly and without noise, by reason of its great depth.

Of appointments to follow in due process, as measured by the progress already made, there is here no room to doubt in regard to the certainty of the practical application of the principles of sanitary science. Our faith is greatly strengthend in this regard by the remarkable manner in which the extraordinary sanitary conditions of Garden City have been developed thus far. From the first, they seem to have been wholly fortuitous. We have no reason whatever to think they formed any part of the original conception, in the founding of this city, of establishing a place of residence convenient and acceptable to the thickly populated cities of New York and Brooklyn. The *place* was described as a barren plain, unsuited and unfit for people to live in, a chimera of the merchant prince, and a worthless purchase. Meanwhile sanitary knowledge was making great progress. Contiguous to the large cities of Great Britain, and to Copenhagen, especially, great successes had been attained, not only in the building of suburban houses as business enterprises, but in the promotion of health and prosperity among the people. These attracted the attention of all such men as Mr. Stewart—all men whose habit of life it is to entertain the welfare of their fellow-men. And in this regard Mr. Stewart's mantle has fallen on worthy shoulders in the person of his eminent executor.

Whatever of prescience formed the guiding star of A. T. Stewart's almost unprecedented success in his business affairs, it at least seems never to have forsaken him in his choice of men—*men* in the fullest and best sense of the word—capable of comprehending his purposes and competent in the application of the best means for the effectual accomplishment of the grandest results. This being done—having chosen his man—he never embarrassed him with either suggestions or details. Being habitually well informed on all subjects which he undertook, and clear in his intentions, he conveyed his suggestions by his close interest in, and manifest comprehension of even the minutest details, of all which he always required an account in full. But beyond and above the exercise of his extraordinary knowledge of men in his business affairs, if for a moment we reflect upon this trait of his character in his highest aspirations—in the choice of his companions and friends—the brilliancy of his genius in this regard seems to eclipse everything else. His widow is found to possess his spirit; Judge Hilton, his counsellor, friend, and executor, is the representative of his genius, which lives on and constitutes his greatest legacy to mankind.

Garden City is emblematical of this portraiture. It was begun and is continued in the same spirit. One master has passed away and another has succeeded; but this is a "continuing city," superintended by the same cultivated taste, animated by the same presiding genius. In its foundation the first care was the choice of a man-

ager. This being made in the person of the late John Kellum, Esq., every step taken since, deliberately and slowly at first, has been with continuously increasing progress, except for an interval after the death of its first manager until the choice of W. R. Hinsdale, Esq., the present manager. Excepting that interval, the progress of Garden City has been characterized from the beginning by a comprehensiveness of grasp, and application of practical means from all sources full of promise for the future.

Those of us, members of the American Public Health Association, who from the time of its organization—and some of us for many years before—to the present time, who have been in the habit of meeting together and discussing the problems of sanitary science; who have from time to time devoted our efforts and means to the elucidation of truths, to the writing of papers, drawing bills for legislative action, and in various other ways applied ourselves to this sphere of labor; and then witnessed, as we have thought, the waste of all our time—the apparent failure of our best efforts—may here find the seed vigorously rooted. Our time and our labors have by no means been fruitlessly spent. Many there may not be, indeed we believe the number to be few, who, to the same extent as the present manager of Garden City, or his predecessor, are capable of grasping and practically applying the truths of sanitary science as they are worked out, to the extent which may here be witnessed. But we may well take courage from this example, and continue to contend more and more earnestly for the propagation of that science to the interest of which this association is devoted.

In conclusion: if to-day, after upwards of thirty-five years' active life as a medical practitioner under various vicissitudes of place and climate, more than twenty years' devotion to the special study of, and considerable practical work in that collective branch of medicine which is now recognized as sanitary science, I were called upon to name a place of residence which comprehends more of the conditions promotive of health than any other with which I am acquainted—the place which gives expression in the largest degree to all that I have learned and labored to apply in this direction, as being most necessary for the promotion of healthy conditions—I should name GARDEN CITY.

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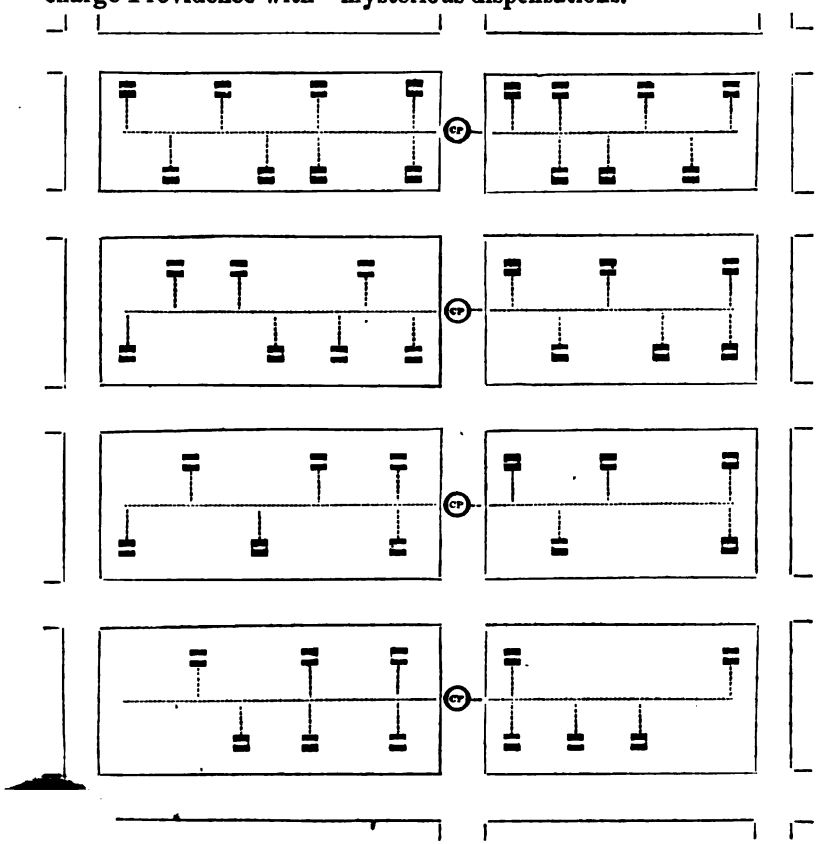
Knowledge, next to religion, is the brightest ornament of human nature. It strengthens, enlarges, and polishes the human soul, and sets its beauty and dignity in the fairest light. Learning hath made astonishing distinctions among the different nations of the earth.

Those nations who have lived under the warm and enlightening beams of science have appeared like a superior order of beings in comparison with those who have dragged out their lives under the cold and dark shades of ignorance. The Chaldeans and Egyptians, as well as the Greeks and Romans, while they cultivated the arts and sciences, far surpassed, in dignity and glory, all their ignorant and barbarous neighbors. A few learned men in each nation have done more to spread their national fame than all their kings and heroes. The boasted glory of Britain is more to be ascribed to her Newtons, her Lockes, her Addisons, her Howards, her Jenners, and her Parkes than to all her kings, and fleets, and conquerors.

ECONOMICAL AND PRACTICAL SEWAGE DISPOSAL FOR VILLAGES AND SMALL TOWNS.

To the Editor of THE SANITARIAN:

The subject of sanitary reform so ably directed in your magazine, and especially as to the disposal of sewage and garbage in communities, leads me to submit an inexpensive yet effectual plan which may be easily adapted to the wants of thousands of villages, and even of the smaller cities, throughout the country. In many cases there are difficult physical objections, and in some there are insuperable financial difficulties, in the way of an extended sewage system. Often it is a matter looked forward to by the progressive and leading spirits in the community as something desirable and to be hoped for in the future, but not yet attainable. In the meantime diphtheria and typhoid, like the dragons of old, stalk out from their caverns *in the back yards* and snatch their victims from among the young and the fairest, while the stricken households piously charge Providence with "mysterious dispensations."



It is not always practicable to bring pure water from a distance for domestic uses, but *it is always practicable to prevent the contamination of the local supply in wells.*

The plan submitted may be regarded as an economical commencement of a more extended system for the future; may be extended *pari passu* with the growth of the town, or subsequently utilized in the adoption of the water carriage system, by simply doing away with cesspools and establishing connections. The proper disposition and grading of the pipes will be suggested by the nature of the surface; the sketch shown is supposed to represent a nearly level section of several blocks.

The plan contemplates the laying of glazed sewer pipes through the block, along the rear line of the lots, with which the house drains are to be connected, as shown by the dotted lines. For ordinary village blocks an eight-inch pipe will be ample for the main drain, the house drains to be connected by four-inch pipe; and in all cases, whether connected with closets in the house or in the yard, the waste pipe should be trapped, and have connected with it, just below the trap, a ventilating pipe of not less than three inches in diameter, extended above the roof, and terminating at a distance from windows or chimney flues. A good device would be to construct a dummy or false chimney to enclose the ventilating pipe, to be surmounted with a revolving jack, as is often provided for "smoky chimneys." The street end of the main sewer terminates in a cemented cesspool, located near one side of the street, arched over and provided with a four-inch iron pipe, fitted with a screw cap similar to that of an ordinary fire hydrant, and projecting above the ground about two feet, and in line with the street trees. The lower end of the sewer pipe should extend to the bottom of the cesspool and be furnished with a basket strainer of meshes an inch in diameter.

The removal of the sewage from the cesspools may, and should be effected without any offensiveness even to the most fastidious; and it may also be made a source of revenue to the corporation, perhaps sufficient to maintain the apparatus and to pay for the labor required to manipulate it. For this purpose an ordinary pump of the Knowles or a similar pattern, with disk valves four inches in diameter, and cylinders 7 by 10 inches, actuated by steam from a boiler attached, say 30 by 72 inches; a few feet of flexible suction hose connected with the pump, and provided at the free end with a coupling fitted to the screw of the cesspool-pipe, and a stout piece of flexible discharge-pipe fitted with attachment to a receiving-tank. The whole of this apparatus to be mounted on a strong truck and drawn by a pair of horses to a working position beside the cesspool hydrants, situated as above described. This being done, and the discharge-pipe connected with a water-tight tank (also to be borne on wheels), and the coupling of suction-pipe made with the cesspool hydrant, the contents of the cesspool may be quickly transferred to the tank and hauled away for convenient disposal outside the precincts.

The pumping apparatus and tanks, complete, need not cost to exceed twelve hundred dollars, and should be the property of the

corporation; and, like the fire-engines, should be placed in charge of the chief of the Fire Department, who should be vested with authority to compel, if necessary, the contractor to a proper discharge of his duty. The removal of ashes and garbage should be included in the contract.

The steam-pump might also be utilized as auxiliary to the hand-engines in small towns in extinguishing fires, as it would more than equal in capacity two ordinary hand fire-engines.

February 4, 1878. H.

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The British Empire has recently put forth a collective statement of its area, 7,769,449 square miles; its population 234,762,593; its houses 44,142,651; its density 38 persons to the square mile. The density in the British Isles, 260 to the square mile, is greater than in India, 201 to the square mile. This mighty empire falls below the Russian area, which is 9,000,000 square miles, and below the Chinese in population, which is 446,500,000. But in its strength and resources it is undoubtedly transcendently ahead of all other empires. It is calculated by a Swiss savant that in the course of a few centuries or less the inhabitants of this empire will all speak the English language, and the tongue is really making rapid progress in India. If the empire should permanently hold together its population will exceed that of China, as the available area of land is far greater. In India the British rule has raised the population from 188,000,000 to 206,000,000. In Canada, Africa, and Australia the progress is very remarkable, and in Africa England has at present no rival, and an immense field. Of all the European governments Russia alone has a future that can at present be regarded as in the same category with Victoria's empire. That of Germany can only be expanded by conquest, and that of Austria and France seem to have reached its limit. The statesmanship required to preserve and maintain such an empire as the British must be of the highest class.

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The Cross and the Crescent—A Remarkable Prediction.—About twenty years ago, during the Crimean war, there was published in some of the newspapers of the time this truly remarkable prediction. The first part of it might have been a fabrication, the latter part appears now to be in process of verification. It was quoted as follows in *Littell's Living Age*, vol. 9, second series: "*Remarkable Prediction.*—The following is taken from an old volume of predictions written in the fifteenth century:

"In twice two hundred years the Bear
The Crescent will assail;
But if the Cock and Bull unite
The Bear will not prevail.
In *twice ten years again*,
Let Islam know and fear,
The Cross shall stand,
Crescent wane, dissolve, and disappear."

MENTAL RESPONSIBILITY, AND THE DIAGNOSIS OF INSANITY IN CRIMINAL CASES.

By E. C. Mann, M.D.

Proceedings of the New York Medico-Legal Society, January 2d, 1878.
Hon. G. H. Yeaman, President, in the Chair.

At the present day medico-legal cases are becoming very frequent in which it is necessary to ascertain as to the insanity of a person accused of a criminal act, in its relation to his civil capacity, and responsibility for criminal actions, and also as to feigned or concealed insanity. It becomes, therefore, a very interesting question as to what test of insanity the law should recognize as a valid defence in criminal cases. This question, although one which it seems difficult to settle satisfactorily, and over which judges, lawyers, and medical experts are constantly disputing, assumes every day greater interest and wider significance, owing to the increase of insanity in our country disproportionate to the increase of population during the past twenty years. Without inserting dry statistics, it is sufficient to say that a comparison of the increase of the population from 1850 to 1870 with the increase in the number of insane during the same period reveals an increase of insanity over that of population of about 12 per cent. In the foreign element this is due to marked changes in habits of living, the changes of food, increased intemperance, working more in-doors, living in badly ventilated tenements, disappointment in business expectations, etc., all of which causes combined tend to impair health, break down the nervous system, and tend insensibly toward insanity in the offsping. The increase of insanity in our native population is due largely to a change from a vigorous, well-balanced organization to an undue predominance of the nervous temperament which is gradually taking place in successive generations. The educational pressure on the young, to the neglect of physical exercise; the increasing artificial and unnatural habits of living; the great excitement and competition in business, are all tending to induce and multiply nervous diseases, many of which must terminate in insanity. These causes and the evils resulting from them are propagated by the laws of inheritance in an aggravated and intensified form. Insanity is also appearing gradually at an earlier age than formerly. In former years the average period at which the greatest number became insane ranged between the ages of thirty and forty; but an analysis of statistics shows that this average age is coming on at an earlier period, generally appearing between the years of twenty and thirty. This is owing to hereditary influences, which have gradually become intensified by violation of physical laws in early life, want of proper training, or too high pressure in educa-

tion; and is also due largely to the great mental activity and nervous strain which characterize the present age and state of civilization, and which tend to cause rapid decay of the nervous system. With many persons it is but a step from extreme nervous susceptibility to downright hysteria, and from that to overt insanity. The question of mental responsibility in its relation to criminal cases is one of great interest, and presents a wide field for study and investigation.

The facts of criminal psychology have led the writer to regard the impulse of criminal natures in the light of natural laws; and there is, beyond doubt, an anthropological change which lies at the foundation of criminal propensities. There is a deficient cerebral organization, which lies at the base of these criminal natures, which occasions the disposition to an abnormal moral constitution. The dislike of work and the love of enjoyment are impulses which, when combined, lead especially to crime when that ethic constitution or development is wanting which is necessary to the foundation of a powerful feeling of what is right. A further fundamental element which stands in psycho-physical contrast to dislike of work is a consciousness of excessive physical strength, which leads to arrogance, and thereby to the pleasure of misusing strength against weakness. This impulse leads to the love of bullying, cruelty, and murder, if the higher intellect is absent which should turn the feeling of strength in a right direction, and there is also absent a complete ethical consciousness which should prevent misuse of power. This ethical weakness may be congenital, as has been remarked, or it may arise from deficient education. In the domain of vices, we meet with a peculiar condition of the central nervous system which results in a temporary criminal impulse returning with a certain regularity. Such criminals are temporarily seized with the deepest remorse, and are fortified with the best resolutions. They behave for a time in a most exemplary manner, until they relapse again, which relapse is unanimously attributed by them to an irresistible impulse. This state of *moral epilepsy* is of great significance in the psychology of crime, as a physiologist is led to institute a comparison between such cases and several states of disease, in which a peculiar type is observable, consisting in the fact that attacks of illness of more or less duration alternate with more or less long, and, generally for a time preponderant, healthy intermissions. In a broad sense, we may designate all these pathological states as *epileptiform*, hence the term *moral epilepsy*, which has been adopted above.

Leaving this interesting question of the psychology of crime to proceed with the diagnosis of insanity in criminals, we would ask if the true basis for jurists to proceed upon is not *the protection of the existence of normal persons against the ethically degenerate? And the necessary degree of this protection is, most certainly, an essential measure for the severity of the punishment.* The first trial of note where there was the question of insanity advanced was in 1723, when the trial of Arnold for shooting at Lord Onslow occurred. Although it was shown that Arnold had been of weak understanding from his birth, and that he was doubtless insane, the jury brought

in a verdict of guilty, and Arnold would have been executed had it not been for the intercession of Lord Onslow. The language of the charge to the jury in this case was in conformity to the rule laid down by Lord Hall, that partial insanity does not excuse a person from the consequence of his acts, and that only a total deprivation of reason can furnish such excuse. In the year 1800 the celebrated trial of Hatfield, for shooting at the King, in Drury Lane Theatre, excited much interest. Although it was proved that in 1793 Hatfield, who was a dragoon, had received a number of severe wounds, which had caused partial insanity, so that he was dismissed from the service, and that since that time he had had periodic attacks of insanity, and had been confined as a lunatic, the prosecuting attorney laid down the established rule that a total absence of memory and understanding could alone shield the prisoner from punishment, and appealed to the jury for a conviction on that ground. It was only through the brilliancy of the advocate, afterward Lord Erskine, that the prisoner was acquitted. This trial had a good effect upon the judiciary, as in the year 1812, in the trial of Bellingham for the murder of Spencer Percival, Lord Mansfield laid down the law that the capability of distinguishing between right and wrong was the test for determining the prisoner's responsibility, thus discarding the old theory of an entire absence of all mental power, and substituting this in its place. Afterward the theory of a general knowledge between right and wrong was modified, and the element introduced that the prisoner must know the difference between right and wrong at the time of and with regard to the particular act for which he is on trial, in order to render him responsible, and this test has been preserved to the present time. In the early history of our own country the same barbarism in the treatment of the insane prevailed which darkens the pages of English history. In Governor Winthrop's "History of New England," the case of Dorothy Dalbyr is mentioned, who was executed for killing her child. She was beyond all doubt an insane woman; but this fact was not recognized by Governor Winthrop, who says of her that "she was so possessed with Satan that he persuaded her, by his delusions, which she listened to as revelations from God, to break the neck of her own child that she might free it from future misery." Such was the ignorance and predjudice of the early history of our country. We are at the present day very far from a correct understanding of the workings of the insane mind, for in the recent trial of Scannell the law was laid down as enunciated by the Court of Appeals in 1865, in the case of Willis *v.* The People, which held "that a person was not insane who knew right from wrong, and that the act he was committing was a violation of law and wrong in itself." This theory of right and wrong is utterly inadequate to meet a large class of cases. There are certain cases, familiar to all specialists in insanity, which suffer from impulsive insanity, with a homicidal or suicidal monomania. These patients, without appreciable disorder of the intellect, are impelled by a terrible *vis a tergo*—a morbid, uncontrollable impulse—to desperate acts of suicide or homicide. These patients, often, are fully aware of their morbid state, appreciate perfectly the nature of the act toward which they are impelled, and

feel deeply the horrors of their situation; and yet, if not prevented by restraint, will inevitably commit acts of suicide or homicide. A very remarkable case was under the care of the writer, of a man who would, at stated times, acknowledge that he felt an irresistible desire to kill some one, and would voluntarily enter an asylum and remain there until this morbid impulse had passed away, which was generally a period of one or two months. He has often told the writer that his life was made miserable by the idea that at some time this overwhelming impulse would come upon him so suddenly that he should commit some desperate homicidal act; but is not prepared to voluntarily incarcerate himself in an asylum for life, as his lucid intervals sometimes last for months at a time. The law as laid down at present would not decide this man to be insane, as he fully appreciates the difference between right and wrong, and the nature and consequences of any homicidal act that he may in the future commit. Such cases, which are not at all uncommon, serve to show what fearful injustice may be done under the name of justice when the conclusion is based upon a metaphysical test which is proved by medical observation to be false in its application to the unsound mind. There is still another form of insanity, denominated "Moral Insanity," in which the intellectual faculties are intact, no delusions or hallucinations existing, but where the moral sense seems utterly obliterated. Such persons have no true moral feeling. This is a disorder of the mind produced by disease of the brain, and is an unquestionable form of insanity, as it often precedes other forms of insanity in which intellectual derangement is well marked, as acute mania or general paralysis. In some of these cases there is a modified responsibility, the degree of such responsibility being determined by the particular circumstances of each individual case.

One difficult but important question to be solved is the civil and criminal responsibility of women who plead insanity before courts of justice, and who are often afflicted with kleptomania, pyromania, or who are infanticides, as the result of sexual trouble and disease of the pelvic organs. Such women, under all reasonable conditions, are entitled to the benefit of the doubt, because of their defective mental integrity, caused, perhaps, by pregnancy or by the subsequent emotional excitement attending parturition, which intensifies the cerebral disorder in a brain already morbidly active. With women, extreme nervous susceptibility readily lapses into insanity. In the sexual evolution, in the parturient period, in lactation, strange thoughts, extraordinary feelings, unseasonable appetites, criminal and suicidal impulses may haunt a mind at other times innocent and pure. It is probable, also, that young unmarried women, guilty of killing their own new-born offspring, are so distracted by conflicting feelings, sharpened to morbid acuteness by the great physiological movement of parturition, as to be hardly responsible for their acts.

We come now to the question of the diagnosis of insanity. In most diseases we examine physical signs and symptoms and determine by our senses the existence of such diseases. In insanity, on the contrary, we have to be guided chiefly by our knowledge of the normal functions of the mind, and in our examination have to rely on our intellect rather than on our senses, although of course the

latter are called in to assist us. It is, however, very often extremely difficult to decide with certainty, as medical experts are expected to do, as to the existence of mental disease. In making an examination of a person accused of crime, and in whom insanity is suspected, the person should be visited by the medical examiner, who should draw him into a pleasant conversation, and inquire as to previous attacks of insanity, hereditary history, then into any predisposing causes of insanity, such as intemperance, vocation, habits, etc., which may have operated in the production of insanity. Also as to injuries to the head or spine which may have occurred, sunstroke, etc. The nervous system should then be examined for the existence of any such diseases as paralysis, epilepsy, catalepsy, or hysteria. The different senses, beginning with sight, should also be examined, and in this way it may be discovered if there are hallucinations or illusions pertaining to any of the senses. A great many cases are on the border line which separates sanity from insanity, and it often requires the nicest discrimination to determine whether such a patient has passed this border line. The writer would suggest a series of eight questions which, if adopted by jurists in criminal cases, would prove a most efficient and just test as to the existence of insanity in any given case.

1. Have the prisoner's volitions, impulses, or acts been determined or influenced at all by insanity, and are his mental functions —thought, feeling, and action—so deranged, either together or separately, as to incapacitate him for the relations of life?

2. Does the prisoner come of a stock whose nervous constitution has been vitiated by some defect or ailment calculated to impair its efficiency or derange its operations?

3. Has the prisoner been noticed to display mental infirmities or peculiarities which were due either to hereditary transmission or present mental derangement?

4. Has the prisoner the ability to control mental action, or has he not sufficient power to control the sudden impulses of his disordered mind; and does he act under the blind influence of evil which he can neither regulate nor control?

5. Has the act been influenced *at all* by hereditary taint, which has become intensified so that the morbid element has become quickened into overpowering activity, and so that the moral senses have been overborne by the superior force derived from disease?

6. Was the act affected by, or the product of, insane delusion?

7. Was the act performed without adequate incentive or motive?

8. Does the prisoner manifest excitement or depression; moody, difficult temper; extraordinary proneness to jealousy and suspicion, or habit of unreasonably disregarding ordinary ways, customs, and observances; an habitual extravagance of thought and feeling; an inability to appreciate nicely moral distinctions; and finally does he give way to gusts of passion and reckless indulgence of appetite?

Some or all of which are generally found in connection with trans mitted mental infirmity. It may be argued that these mental defects signify not unsoundness, but human imperfection. Certainly if we take these manifestations, any one of them singly and alone, we cannot claim that such a one is invariably an indication of insanity;

but, on the other hand, under certain circumstances each one of them may be an unmistakable sign of insanity, or rather of a morbid cerebral state which may readily lapse into insanity. The disappointments and calamities of life obviously act with greater effect upon an unstable mental organization; these causes of disturbance meeting with a powerful coöperating cause in the constitutional predisposition. Sometimes a crime, even when there have been no previous symptoms to indicate disease, marks the period when an insane tendency has passed into actual insanity—when a weak organ has given way under the strain put upon it.

There is a class of persons with a peculiar nervous temperament, and in some cases with a specially insane temperament, who inhabit the borderland between crime and insanity, one portion of which exhibits some insanity, but more of vice, and the other portion of which exhibits some vice, but a preponderance of insanity; and it is very difficult to form a just estimate of the moral responsibility of such persons, especially when we reflect upon the fact that moral feeling is a function of organization, and is as essentially dependent upon the integrity of that part of the nervous system which ministers to its manifestations as is any other display of mental function. The writer has met with cases in which, as a result of parental insanity, there has been a seemingly complete absence of moral sense and feeling in the offspring; and this has been a true congenital depravation, or a moral imbecility, so to speak. Of course such children can hardly fail to become criminals. In this connection it is interesting to note that moral degeneracy often follows as a sequence upon disease or injury to the brain. A severe attack of insanity sometimes produces the same effect, the intellectual faculties remaining as acute as ever, while the moral sense becomes obliterated. When such persons are acquitted, on trial for a criminal act, on the ground of insanity, they should be remanded to medical custody, and should never be set at liberty until the medical superintendents of asylums deem them fully recovered. But the commonest justice plainly indicates that such custodial restraint be of a medical, and not of a penal nature. It is a very difficult thing for the laity to realize how sane a person may appear, who all the while has a greater derangement than was even suspected, until something happens to elicit the evidence of it such as an attack of illness or severe mental strain, some unconquerable impulse seizes him, and some homicidal or suicidal act results to the great surprise of every one. In the same manner inebriety often appears in maturity as a result of ill health, mental shock, etc.; and it becomes an interesting question as to the degree of moral or criminal responsibility which attaches to inebriates, as inebriety often depends upon an abnormal organic development of the nervous system that has descended from generation to generation, gaining in intensity until it manifests itself in active inebriety, and there must certainly be a modified responsibility when homicidal or suicidal acts are committed during periods of such abnormal cerebration. In such cases a criminal act may be committed in consequence of cerebro-mental disease, without any apparent lesion of the perceptive and reasoning powers. In these cases, also, the

mental disorder is of a sudden and transitory character, not preceeded by any symptoms calculated to excite suspicion of insanity. It is a transitory mania or sudden paroxysm, without antecedent manifestation, the duration of the morbid state being short, and the cessation sudden. In these cases the criminal acts are generally monstrous, unpremediated, motiveless, and entirely out of keeping with the previous character and habit of thought of the individual. Such attacks are transient in proportion to their violence, and the transition occurs on the completion of the act of violence. There is an instantaneous abeyance of reason and judgment, during which period the person is actuated by mad and ungovernable impulses.

(*To be continued.*)

"Lunacy."—The belief which was once common that it is dangerous to sleep in the rays of the moon, has long been regarded by scientific persons as absurd. Notwithstanding, there is enough of superstition among many sensible people, particularly among the seafaring, to make them habitually cautious in this regard. A gentleman living in India, having had his attention especially called to this subject, furnishes *Nature* with the following explanation:

"It has often been observed that when the moon is full, or near its full time, there are rarely any clouds about; and if there be clouds before the full moon rises, they are soon dissipated; and therefore a perfectly clear sky, with a bright full moon, is frequently observed. A clear sky admits of rapid radiation of heat from the surface of the earth, and any person exposed to such radiation is sure to be chilled by rapid loss of heat. There is reason to believe that, under the circumstances, paralysis of one side of the face is sometimes likely to occur from chill, as one side of the face is more likely to be exposed to rapid radiation, and consequent loss of its heat. This chill is more likely to occur when the sky is perfectly clear. I have often slept in the open in India on a clear summer night, when there was no moon; and although the first part of the night may have been hot, yet toward two or three o'clock in the morning the chill has been so great that I have often been awakened by an ache in my forehead, which I as often have counteracted by wrapping a handkerchief around my head and drawing the blanket over my face. As the chill is likely to be greatest on a very clear night, and the clearest nights are likely to be those on which there is a bright moonshine, it is very possible that neuralgia, paralysis, or other similar injury, caused by sleeping in the open, has been attributed to the moon, when the proximate cause may really have been the *chill*, and the moon only a remote cause acting by dissipating the clouds and haze (if it do so) and leaving a perfectly clear sky for the play of radiation into space."

FLORIDA: AN INSIDE VIEW OF HER RESOURCES AND INDUCEMENTS TO SETTLERS.

The inducements to immigration and settlement in Florida may be overstated. Unfortunately this has been too often done; and in some cases has resulted in disappointment, discontent, and pecuniary loss to those who have been influenced by such partial representation.

It is not true that money grows on trees with us, except, indeed, in the form of oranges and other fruits, the product and reward of patient labor continued through a series of years.

It is not true that fortunes may be acquired in a short time by any of the methods known to honest and legitimate enterprise, excepting only by a judicious employment of capital.

It is not true that our circumstances afford so cheap a mode of comfortable living that a man can enter the pine woods without capital, and maintain himself and family without stint and embarrassment until trees grow, bear harvests, and secure an income.

It is not true that ventures may not fail, that hopes may not be blighted, and that what appear to be rational and sober expectations may not prove deceptive and fail of realization.

It is not true that immigrants from older States and denser populations, with the outward material appointments of civilization—roads, markets, schools, churches, social arrangements—may not experience discomfort and be compelled to part, for a time at least, from much that is pleasant and desirable.

It is not true that anybody and everybody can command certain success in orange culture, or any other culture; for many have failed for want of skill in planning, choosing locations, and executing designs.

It is not true that oranges can be safely and profitably grown *anywhere* in Florida; on the contrary, north of a well ascertained latitude, although the trees can be grown, the fruit is liable to be injured or destroyed by frost three winters out of five.

It is not true that Florida lands *generally* are suitable for the healthful and profitable growth of the orange-tree; on the contrary, even in the *orange belt* of the State, not more, perhaps, than *one* acre out of forty acres has such a soil—has the elements and conditions of nature so mixed as to insure any reasonable success in this branch of production and industry. The selection of suitable soils and localities may not be remitted to science; at least one analytical chemist has pronounced a certain soil, with some slight ingredient to be supplied, admirably adapted to produce oranges, and the proprietor, relying implicity upon such assurance, has almost reduced himself to pecuniary ruin by prodigious efforts to make that soil yield a return, which is still unsuccessful. The selec-

tion of proper and desirable locations ought to be referred to practical, sensible men, who have experience gained by residence and practice. Let the immigrant take time to make haste; let him get hold of native, or long resident men, of good common-sense and high moral character (there are such men), and take counsel of them, and not of speculators and land monopolies. We have other productive industries which can be safely combined with any well directed effort to establish an orangery. Cotton, sugar, early onions and other vegetables, can be grown for market and for use. Even the sweet potato, the commonest of all domestic products, sells with us, for the most part of the year, at from twenty-five cents to one dollar per bushel. There is no finer region for poultry, or for the honey bee. At this time our home market for eggs is 50 cents per dozen; honey in the comb, 20 cents per pound; fresh milk, 50 cents per gallon. These are homely facts; but facts, nevertheless, of great interest in domestic economy. It is a well understood fact that in the northern, middle, and western portions of the State richer lands can be obtained, and the *ordinary* products of the southern country are grown in greater abundance. Speaking in a general way, it may be stated that the country south of latitude 29° 30′, or south of Lake George, on the St. John's, is not, and is not likely ever to become, self-supporting in the cereal harvests—corn, oats, wheat, etc.—nor in the articles of pork and lard. Indeed the small grain crops are not cultivated at all; and only occasional corn farms are to be noted; though, on the better lands, from twenty to thirty bushels per acre can, with favorable seasons, be realized.

All these products are imported either from New York or more directly from the West.

It is known that well informed men, having capital at command, have, for some years past, hesitated to make investments in this State on account of the enormous rate of State taxation and the waste of the public revenue by a prodigal and reckless State administration. This state of things, fortunately, has ceased. *We touched the bottom, and rebounded.* The expenditures of the State government, which had reached nearly half a millon a year, will now be reduced for the first year of Gov. Drew's administration to about $200,000; and His Excellency has already issued his proclamation directing the tax collectors to collect only about three-fifths of the taxes assessed by the last General Assembly, as that would amply provide for the annual current expenditures. Our people breathe more freely in the assured prospect of an honest conservative government, and a steady moderate rate of taxation on property. State credit is being placed on a firm basis, and future prosperity is anticipated with confidence.

In relation to the cultivation of the orange as a business, I have stated several facts *negatively;* and I now proceed to state some additional facts affirmatively. There is, perhaps, no productive industry in the United States which offers a more secure basis for the investment of capital than an orange grove in South Florida, provided the location be well chosen, and the soil well adapted to the growth and development of the trees. There are trees now bearing fruit which have been bearing fruit for *a hundred years.*

The markets of the United States could not be fully supplied from the home product if all the orange lands were in cultivation. Imported oranges are subject to a tariff duty, and the home producer starts with that advantage in its favor. The foreign fruit must be brought in by the ship-load and thrown upon the market at some price. The home product can be put on the market in small quantities, at any time from the first of November to the first of April, the reserved fruit remaining on the tree in perfect preservation till required for shipment. One thousand oranges a year from each bearing tree, taken for years together, is rather an under-estimate of the yield. From fifteen to twenty-five dollars per thousand, according to the more or less advanced period of the year, is the actual ruling price to sellers on the ground. Ordinarily, about seventy-five trees are planted to the acre, giving ample room for development.

The inquiry will be pertinent, *If these facts are fairly stated, why don't everybody in your favored land get rich and become quite independent?*

Answer. Because, first, everybody has not possession of good orange lands; second, everybody has not skill and ability to labor; third, everybody has not been accustomed to hard work, and some bodies are constitutionally lazy; fourth, and mainly, everybody has not the indispensable cash reserve to enable him to provide for the current expense of living, and at the same time give his own labor, or hire the labor necessary to open lands, purchase trees, plant trees, cultivate trees, and wait five or more years till the trees produce an income. Now, there you have *an inside view* of the situation. For the most part our people are poor. Many have the disposition, the skill, the energy required, and need only timely advances of capital to accomplish very desirable results both for themselves and partners in interest. This is, indeed, *the* method for the safe investment of capital and the sure development of this branch of business.

A, resident, has blank acres of excellent orange land, and desires to improve, but has not the means. B, non-resident, has a few thousand dollars to invest in something undoubtedly safe and profitable, but cannot assume any personal oversight, nor any responsibility of management. A puts in his land, and covenants to bestow all the labor and supervision for a term of years, and then divide the property with B, in consideration of the advancement by instalments of blank dollars as specified in contract. This is the whole matter. And if A is an honest man, and the lands be judiciously selected, there can scarcely be a possible failure. Both of these conditions can be almost infallibly secured by acting through a disinterested, honorable, competent resident agent.

One pertinent fact is worth a hundred arguments. To avoid tediousness I state these facts in illustration:

Mr. William Markham, of Atlanta, Ga., formerly of Hartford, Connecticut, purchased a property of two hundred acres within six miles of this place, and employed Capt. R. H. Marks to have 100 acres of the land put in cultivation and planted in orange-trees, under a contract with various stipulations, providing for a division

of the property at the end of a fixed period, Capt. Marks thus prospectively acquiring *one-sixth interest.* Two years have now elapsed. The grove has been well planted and is very promising. Some of the trees planted were seedlings of advanced growth, and are now beginning to bear. After two more years, it is estimated, the fruit will meet current expenditures; and then, rapidly exceeding that, will yield a princely income. Original cost of 100 acres, about $5,000; otherwise expended to date, $15,000, including steam power and proper outfit for purposes of irrigation. Funds advanced by Col. Markham. The property is now estimated to be worth $50,000. In a few more years the harvest ought to reach 7,000,000 oranges annually, which, at minimum rates, ought to realize over $100,000.

A gentleman residing at Rome, Ga., having some open land within one and a half miles of this place, contracted with our excellent neighbor, Dr. C., to plant out some fifteen acres in young seedlings, to cultivate the land in any crops, to keep it clear of weeds, and divide the property after a fixed period. Two years since the field was divided, though the trees are not yet in bearing, and the doctor sold his half for $3,500 cash; while the same property could not now be bought for eight thousand dollars.

Another gentleman, one of our best citizens, purchased a property of 120 acres within three miles of this place at $1,200, and a gentleman from the North agreed to advance the necessary funds to plant and improve, dividing equally at the end of four years. The latter advanced by instalments about $8,000, and at the period fixed the parties divided. One of them sold the greater part of his half a year ago for twenty thousand dollars.

I have only to add, if any parties desire to make an investment of this character, and think proper to refer the negotiation to me for Orange County, I will make myself responsible for these conditions:

1. That the party recommended for a contract is a morally trustworthy and competent man.
2. That his title is perfect.
3. That his lands are well adapted to orange culture.
4. That any contract agreed upon shall be executed in a legal, binding, and effective form, under the laws of this State, and in accordance with the requirements of the several acts of Congress where the title has been derived directly from the United States.

J. Woffard Tucker.

Mellonville, Fla., December, 1877.

Country Air.—"People may say what they will about country air being so good for them," said Mrs. Partington, "and how they get fat upon it; for my part, I shall always think it is owin' to the vittles. Air may do for camamiles and other reptiles that live on it, but I know that men must have something more substantialler."

Editor's Table.

Death Traps in New York.—An official report.

SANITARY BUREAU—HEALTH DEPARTMENT,
301 MOTT STREET, NEW YORK, January 14, 1878.

M. DEF. DAY, M.D., *Sanitary Superintendent:*

SIR—In accordance with your instructions I have carefully inspected the buildings recently erected on the south side of East Fifty-second street, between Fourth and Lexington avenues, known as numbers 100, 102, 104, 106, and 108 East Fifty-second street, with the view of ascertaining whether there is anything in the construction of said buildings, such as bad drainage or ventilation, that would tend to produce the sickness which has developed in many of them since their occupation as dwellings. The following conditions were found, which are considered dangerous to life and detrimental to health, viz.: The houses are four stories in height, built during the past spring, and are rented out as flats. The earth beneath the basement floor was very damp, and retained considerable moisture, due to defective drainage. The sewer-pipe is used in common by several adjoining buildings, and the portion inspected, on taking up the floor, showed that the lengths of earthenware pipe, of which it is constructed, are slipped one into the other without cement or other attempt to make a close joint. This method of construction leaves the hub of the pipe open for the escape of sewer-gas into the apartments and also tends to cause a saturation of the soil beneath the house in case of obstruction in the sewer, which is very common to houses of this kind. The soil-pipe at No. 100 was also found open, without any attempt at a joint at the point where it discharged into the sewer-pipe. This necessarily caused a constant escape of foul air and sewer-gas from the main sewer into the building, which is conveyed by means of the recess in which the soil-pipe is set throughout the house, and diffused through the apartments of the occupants. The soil-pipe, which extends to the surface of the roof, is also used as a leader, so that when we have a heavy rain there is absolutely no ventilation for the drain, and a compression between the main sewer and the roof exists, that causes all the foul gasses to be forced through the defective pipes and joints into the houses. The lead trap from each water-closet, where examined, was found to connect with the iron soil-pipe by a cement or putty joint, and the lead trap from the sink on each floor was joined to an unventilated waste-pipe by means of a similar putty or cement joint, and in some instances was found slipped into the iron pipe without any joint whatever. A joint made with putty or cement between an iron pipe and a lead trap cannot be relied on, as from many causes, such

as the settling of a wall or pipe, or the drying of the cement or putty an opening is made which is sometimes hardly perceptible, that allows a free ingress of sewer-gas into the building.

At No. 100 one death has already occurred from malarial fever, and several persons are prostrated from the same complaint; the building has not been free from sewer-gas since it was built. At No. 106, two cases of diphtheria occurred, and the persons who lived there at that time informed me that they were always subject to foul odors, which caused them to remove. Two of the family who have since moved into the same flat have also taken diphtheria.

At No. 104 there is a case of typhoid fever. As it is apparent the conditions enumerated will seriously impair the health of all persons dwelling there, I have forwarded to this Board a special complaint against each house, with the recommendation that a separate sewer connection by means of an iron pipe, with joints well caulked with lead and laid in accordance with the regulation of the Department of Public Works, be made; that a proper trap be provided in each sewer-pipe near the outer wall, so adjusted as effectually to prevent the entrance of sewer-gas into the building; that the lead trap of each water-closet and sink be connected with their respective soil and waste-pipes by and through an iron sleeve with joints well caulked with lead; that each independent waste-pipe be extended two feet above the roof, and that the cellar of each house be connected with the sewer thereof, so that the same may be properly drained. A short distance from the row of houses described there is another row almost precisely like it, and I have been credibly informed that many other houses have been recently erected in the manner described, a partial list of which is in my possession. As soon as an inspection of these can be made, a report will be forwarded to this Department stating their actual condition.

Very respectfully,

THOMAS J. NEALIS, Sanitary Engineer.

In addition to an enormous quantity of such villainous work in New York and Brooklyn as that above described, it is a common practice for plumbers to put in "safety pans" under the washstands of the best houses, against the danger of leeks to the frescoing. These pans are usually provided with S traps, of about an inch in diameter, connected with the house drain-pipe, ostensibly to prevent the escape of sewer-gas into the rooms, and yet they are never sealed—never have any water in them—unless there is a leak under the washstand! Not long since we were called upon to examine a "first class" house in which there had recently been two deaths from diphtheria: the washstands throughout the house were all thus provided with these *death* traps—not one of which had any water in it; all the chambers were in free communication with the main house sewer-pipe. And the house was "elegantly" plumbed throughout, without regard to expense, or common-sense. As com-

monly pursued, the trade of plumbing is fraught with danger comparable only with rum-selling, and scarcely less fatal to the health and lives of the people; and, like it, should either be wholly prohibited or placed under such legal restrictions as will effectually protect the health and lives of the people.

The Meeting of the Medical Society of the State of New York, at Albany, January 15th–18th, was not quite so large nor as interesting as usual, on account of several embarrassments under which it labored; one of which—the questioned legality of the meeting—was anticipated and accepted by some members and delegates as a cause for non-attendance.

Dr. A. L. Saunders, the vice-president, called the society to order at the appointed time; and stated that Dr. J. Foster Jenkins, who was elected president at the last meeting, declined to accept the office. This he first learned by a letter from Dr. Jenkins on the 20th of December. Dr. Jenkins's declension devolved the duties of presidency upon him; but the intervening time had been too short to enable him to prepare an address as contemplated by the Society, he was therefore constrained to ask the indulgence of the Society for its omission. He briefly recognized the continued progress of the profession, and its prosperity in the State, and concluded his opening remarks by announcing the Committee on Credentials: Drs. N. C. Husted, E. H. Lyman, and H. M. Porter, and declaring the Society organized and ready for business.

The Secretary submitted a communication from Dr. Jenkins, declining to accept the presidency to which he was elected in June last, and also a check from him to the treasury of the Society for $25, the forfeit imposed by a by-law of the Society on a president who fails "at the end of the year after his election to office to deliver a dissertation on some appropriate subject." Both declension and check were accepted, the latter, apparently, in this case, in default of acceptance of the presidency.

Dr. Saunders next announced the following committees:

Arrangements—Drs. Wm. H. Bailey, J. N. Northrop, and W. Manlius Smith, the Secretary.

Business—Drs. E. R. Squibb, Wm. C. Wey, and D. B. St. John Roosa.

Ethics—W. C. Wey, D. B. St. John Roosa, and James Chapman.

After the adoption of a series of resolutions defining the conditions of representation, and a brief recess for the arrangements necessary to the work of the Committees, the business of the Society was rather irregularly proceeded with under the direction of the

Chairman of the Business Committee, in striking contrast with the process of the business at the last session, when everything was progressed by the presiding officer. Notwithstanding, the Chairman —of the Business Committee—found it necessary to begin his duties by calling the attention of the Society to a remarkable oversight, under his presidency last year, in consequence of which the Society had committed itself to an illegality in regard to the time of holding its annual meeting. The subject was referred to the Business Committee, and subsequently reported upon, in effect declaring the present meeting an adjourned annual meeting; that the President, Secretary, and Treasurer, with twelve members and delegates, meet in Albany on the third Tuesday of June to ratify the proceedings of this meeting and make it legal. Also changing the time of the annual meeting to the first Tuesday in January, the time when the Society originally met. The report was adopted.

A sense of sorrow pervaded the Society on the announcement of the death of a much loved member and ex-president, Dr. Henry W. Dean, of Rochester, on Sunday, January 13th, which found feeble expression in a resolution of sympathy adopted and telegraphed to the family of the deceased.

Several of the most regular attendants and some of the best workers of the Society, from Rochester and vicinity, were absent on account of Dr. Dean's death.

Deaths of Dr. Hiram Corliss and Dr. L. B. Cobb were also announced as having occurred since the last meeting.

The sessions were well attended throughout, and the usual interest in the prosperity of the Society manifested. The number of papers read was smaller than usual, probably on account of the shorter interval since the last preceding meeting, affording an abundance of time for discussion, which was mostly occupied by the Chairman of the Business Committee.

The chief papers were: *Punctured Wounds of the Stomach*, by Dr. Eugene Beach; *Contribution to the Study of Auditory Epilepsy*, by Dr. George Bayles; *Registration of Vital Statistics*, by Dr. Elisha Harris; *Uniformity of Medical Observations*, by Dr. E. Seguine; *Antiseptic Surgery*, by Dr. Stephen Smith; *Laceration of the Cervex Uteri*, by Dr. W. B. Chase; *Estimation of Urea*, by Dr. M. Perkins; *Detection of Leukæmia, and Method of Enumerating White Blood Corpuscles*, by Dr. Jas. G. Richardson, of Philadelphia; *Ischæmia of the Retina*, by Dr. Thos. R. Pooley; *Intracranial Tumors*, by Dr. Arthur Matthewson; *Hydrobromic Acid*, by Dr. E. R. Squibb; *Diseases of the Salivary Glands*, by

Dr. Goodwillie; *Intussusception*, by Dr. Benedict; *Nerve Stretching in Sciatica*, by Dr. Giberson; *Removal of Uterine Fibroid, and Electrolysis in the Treatment of Uterine Fibroids*, by Dr. Van Derveer; *Diet and Hygiene in Diseases of the Skin*, by L. D. Buckley, and a disjointed *Report on School Hygiene*—the special subject of report by the standing committee on Hygiene. The Chairman of this Committee being absent—notwithstanding there was a member of it present authorized to represent him, and a written request by the Chairman that a special time be appropriated for hearing and discussing the report, according to the practice for several years hitherto—the Chairman of the Business Committee suggested, by extended remarks, that the whole subject should go over until the next meeting. A better mind prevailed, however, and papers on the subject were read by Dr. Harvey Jewett, Dr. A. N. Bell, and a communication from the Medico-Legal Society of New York; but these papers, instead of being consecutive, were each in different sessions, giving no opportunity whatever for discussion—discussion being postponed at the suggestion of the Chairman of Business Committee, until all the papers on the subject were read; while the third one was the concluding paper read at the last session, and after the bearer of it, Dr. C. S. Wood, from the Medico-Legal Society of New York, who was expected to read it, had gone home.

Other committee reports and subjects of special interest acted upon were: A resolution appointing a committee to secure the passage of a law for the proper compensation of experts when called as witnesses; by the Committee on By-Laws, recommending that medical students be submitted to an examination in languages; progress on the codification of the By-Laws; by the Committee on Ethics, on a communication from the New York County Medical Society referring the subject back to the County Society. Resolution declaring it a breach of the code of medical ethics for any one who is in the *general practice* of his profession to use upon his sign or bill-heads, or in advertisements, the words "Eye and Ear Infirmary," or "Oculist and Aurist," and requiring the erasure of "New York Food Company" and "Nestle," from Dr. Bulkley's paper, as a condition of its being published in the Transactions; "inasmuch," remarked Dr. Squibb, "as the article of food prepared by them was patented." In his opinion, "simply the retention of the name in the paper read would be a violation of the medical ethics of the Society." *Food* being neither surgical instrument, medicine, nor *nostrum*, we are at a loss to find any reason for bringing it under the

bans of the code. It is surely not so by the letter, and if the spirit of the code is to be counted and applied to all unofficinal preparations, proprietary as well as patent, the sooner the code is utterly disregarded the better. For it is everywhere regarded in the affairs of life, in which the practice of medicine is no exception, that the name of the proprietor or maker of any given article is frequently the best guaranty of its genuineness. And in this particular instance, ethics or no ethics, we regard the action of the Society as absurd.

Officers elected for the ensuing year: President, D. B. St. John Roosa, of New York; Vice-President, Judson C. Nelson, of Cortland; Secretary, Wm. Manlius Smith, of Onondaga; Treasurer, Charles H. Porter, of Albany.

Receptions and Entertainments were given by his Excellency Governor Robinson, the Dudley Observatory, and the Albany County Medical Society. This last, especially, given at the Delevan House, was a prominent feature of the meeting, and added much to the pleasures of all who attended by enabling them to become personally acquainted with one another, and in the promotion of general good-fellowship.

The Messrs. Leland, of the Delevan, unequalled caterers as they are everywhere acknowledged to be, were, according to their custom, all attention to their guests; and their attentiveness did much toward enhancing the pleasures of the gathering.

Hygiene in America.*—Dr. Bowditch's Centennial Address in its abridged form, as delivered before the International Medical Congress, has been, by vote of the Congress, printed and sent to the Governors of all the States, to those of the various provinces of Canada, and to the Presidents of all the State Medical Societies throughout the country. The high estimate thus placed upon that *abstract* (of the work now before us), by the Congress of distinguished medical men before whom it was delivered, fittingly suggests the importance and value of the material, in the aggregate, from which it was taken. To all who may have had their attention for the first time attracted to the subject of State Preventive Medicine by that ad-

*Public Hygiene in America: Being the Centennial Discourse delivered before the International Medical Congress, Philadelphia, September, 1876. By Henry I. Bowditch, M.D., with extracts from correspondence from the various States. Together with a Digest of American Sanitary Law, by Henry G. Pickering, Esq. 12mo, pp. 498. Boston: Little, Brown & Co: London: Trubner & Co.

dress, and equally to those who may hereafter have their attention attracted to the subject by it, or by other sources of information, the volume now under consideration is, and will continue to be, of increasing interest. And that the number of persons interested in preventive medicine will greatly increase in coming years no one will question who at the present time appreciates the significance of that stage in the progress of medicine which it is the special object of this book to insulate.

The Centennial Discourse, proper, takes up the first one hundred and twenty-two pages, in which is traced the various changes through which practical medicine has passed during the century, and the "gradual evolution of the idea of State preventive medicine during the centennial period." This period the author divides into three epochs: First, from 1776 to 1832, led by Benjamin Rush, of America, and Broussais, of France; the epoch of drugs and almost supreme faith in the art of medicine—of heroic dosing—with little or no faith in Nature's ability to cure disease. Second, from 1832 to 1869, led by Louis, of France, Forbes, of England, Bigelow and Bartlett of America, who had profound reverence for Nature's power in limiting and curing disease. They exerted themselves for the overthrow of the preceding epoch of mere drugging, and gave glimpses of the third and last epoch, the epoch of preventive medicine, which began in 1869, by the establishment of the first State Board of Health, and "extends into the far-off future."

Of the third epoch, or that in which the medical profession is aided by the laity, and State preventive medicine inaugurated, the author remarks: "It is with a feeling somewhat allied to regret that I must say we owe more to the laity than to the profession, the awakening of the spirit which governs this epoch and which is to hold sway in the long future of *State preventive medicine*. Preëminent as pioneers in this epoch stand two laymen, Edwin Chadwick, of London, and Lemuel Shattuck, of Boston." These and the other leading spirits named in the several epochs are sketched with the hand of a master thoroughly in love with his work, and leaves no wonder why this Centennial Address was received with such favor by his fellows as to commend it to all State authorities throughout the country as "a *cordial all-hail to coming centuries*, not only in America, but in every civilized spot of God's earth, because everywhere, and to all coming time, human life will be lengthened, made more healthy, and consequently more truly happy, by the potent influence of *State preventive medicine*."

Following the address is an "Analysis of Answers to Various Questions submitted to Correspondents resident in all parts of the

Country," upon which the discourse is in part founded. The remainder, and much the larger portion of the work, is an Appendix: comprising, Circular to Correspondents, with a list of their names and extracts from their letters; Returns from Universities and Medical Colleges, and the amount of attention given to instruction in public hygiene and preventive medicine; Digest of American Sanitary Law, by Henry G. Pickering, Esq., Counsellor-at-law; Louis's Estimate of James Jackson, Jr.; Law of Soilmoisture as a cause of Consumption in Massachusetts and elsewhere; Massachusett's Law on Slaughter Houses and Noxious and Offensive Trades, and European Sanitary Work.

This *Appendix* is very far from being a mere summary of data, as the titles might lead one to suppose. It comprehends the only Digest of American Sanitary Law hitherto published, and various reports on State and Municipal sanitation of great practical utility to all authorities and officers interested in civic cleanliness and the practical application of preventive medicine.

Maryland's Public Charities, Reformatories, and Prisons—as displayed by the Secretary of the State Board of Health on the authority of the Governor*—are a burning shame to her people, and more, to the whole people of the country; for the inhumanities here portrayed are but an example of similar conditions common to almost every State in the Union. A little less than a year ago the Governor of Maryland addressed a letter to the Secretary of the State Board of Health, directing him "to visit and inspect the prisons, alms-houses, and hospitals in the various counties of the State, and report to him at as early a day as practicable their sanitary condition, the treatment of the inmates, and particularly the number of pauper insane who are confined at the expense of the counties, together with a statement of the character of the insanity, and any other facts of interest that may lead to the improvement of their condition." The report throughout is singularly cogent.

Of the insane: "There are now within the alms-houses and jails of this State over five hundred insane and idiotic people, for whom there exists no provision, and who are utterly cast down and neglected, half fed, and ghastly in their wretchedness. It is impos-

* Report on the Public Charities, Reformatories, Prisons, and Alms-houses of the State of Maryland, by C. W. Chancellor, M.D., Secretary of the State Board of Health. Made to His Excellency John Lee Carroll, Governor, July, 1877. Pages 163.

sible to imagine anything worse than the brutal degradation and cruelty to which the insane are subjected in some of the county alms-houses, where they are chained to solitary wretchedness, breathing an atmosphere quite as obnoxious to human lungs as the water of a stagnant pond would be to the trout of a mountain stream. In one of these dens I found a wretched female maniac, quite naked, and filthy beyond all conception, crouched in a corner of a dark, fœtid room, without ventilation, where she was confined by day and by night, with no other bed than the floor, which was literally covered with her own slimy, putrescent excretions, and emitted a most disgusting and sickening stench."

Of children: "In some of the alms-houses and most of the jails there were found children ranging in age from one month to fourteen years. It is indeed melancholy to contemplate these little ones growing up in such haunts, with every faculty as soon as developed blunted and tarnished by the moral atmosphere surrounding them. The first condition in which they are placed is analogous to that of a beggar. They are made to feel that they are receivers of alms, and they learn to consider it no shame. The first exercise of reasoning power only leads them to discover that there are other means of getting through the world than by self-exertion, and they naturally become tame, spiritless, and worthless creatures, or pests to society."

Of prisoners and witnesses: "In not a few of the jails the inmates were found herded together—the sane and the insane, the young and the old, the untried prisoner, the convict serving out his sentence, and the witness charged with no crime whatever. Nor are the sexes always separated, but in many instances they were found mingling together, with results alike revolting and disgraceful."

Thus graphically are portrayed various county institutions, illustrated by examples of moral guilt on the part of the civil authorities, in enforcing disease, immorality, and vice upon others, greater and more criminal than the vices and crimes over which they exercise authority. In contrast with these, for the most part county institutions, some of the various State hospitals and institutions for the insane, deaf and dumb, blind, and reformatory, are creditable to the State and their superintendents. The report is very far from being a mere exposure, it is fruitful in sound suggestions for radical changes and improvements, including and urging the speedy completion of a house of correction adapted to the proper care of able-bodied vagrants, and other measures eminently creditable to the author, and commendable to all in authority.

Death-rates per 1,000 inhabiants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Pox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Typ. Fevs	Malarial Fevers.	Diarrhœal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500—5 weeks ending Jan. 26..	2509	24.05	981	440		147	120	37	60	32	21	32	47	27	56
Philadelphia, 850,900—4 weeks ending Jan. 26..	1231	17.62	436	206		57	45	2	53	5	32		1	3	79
Brooklyn, 528,000—5 weeks ending Jan. 26....	1008	19.15	434	167		62	59	2	54	6	2	1	2	17	84
St. Louis, 500,000—4 weeks ending Jan. 26.....	366	9.51	153	54	1	10	3		3	1	7	11	4	6	8
Chicago, 460,000—3 weeks ending Jan. 5, 19, 26.	363	13.67	1-3	27	5	16	12	3	7	6	4	3	5	4	49
Baltimore, 350,000—4 weeks ending Jan. 26 ...	504	18.72	191	91		22	11		17	3	10	2	9	2	59
Boston, 363,000—4 weeks ending Jan. 26.....	544	19.5	173	135		46	8	1	10	12	13		5	2	?
Cincinnati, 280,000—2 weeks ending Jan. 5, 19..	153	14.2	48	24		2	4		1	2	5		4	1	13
San Francisco, 300,000—month of Dec.....	468	18 52	155	59	1	41	4	8	10	5	27		7	3	25
New Orleans, 210,000–5 weeks ending Jan. 27..	478	23.66	122	76	14	3			6		4	8	21	5	35
Washington, 160,000.....															
Pittsburgh, 147,000—month of Jan.....	308	23.	137	36	33	40	6	1	2	8	11		2	4	?
Newark, 126,000.....															
Providence, 103,000—month of Jan.	207	24.11	88	27		41	2	11	4	2	2		2		12
Milwaukee, 123,000—month of Dec.....	169	8.35	87	14	17	6	11		2	2	5		1		10
Rochester, 70,000—month of Jan...	97	10.63	45	13		5			2		1				8
Richmond, 77 000—4 weeks ending Jan. 26.....	88	14.85	29	21			7		1	2			3		11
New Haven, 60,000—month of Jan.....	88	17.6	32	13	3	12	4		6	1	1				4
Charleston, 57,000—4 weeks ending Jan. 26.....	103	23.49	29												19
Toledo, 50,000—.....															
Mobile, 40,000—month of Dec.....	73	21.9	19	10		1					2	1	4		7
Dayton, 36,000—5 weeks ending Jan. 31.....	39	11.22		3					1	2	2	1			2
Nashville, 27,000—.....															
Wheeling, 28,370—year 1877.....	508	17.96	198	60	1	12	57		1	4	15	3	22		49
Buffalo, 170,000—.....															
Knoxville, 18,000—month of Jan..... ...	14	12.92	5	1	2			1							2
Paterson, 40,000—2 months ending Jan. 31.....	124	18.06	56	14		8	6		4		1		1		7
Petersburg, 20,000—.....															
Selma, 8,000—month of Dec.....	12	16.37	6	2				3							1
Elmira, 20,090—month of Jan.....	38	22.7	14	3		10				1	3		1	2	?
Yonkers, 18,000—month of Jan....	23	14.95	6	4			1		2					1	?
Memphis, 45,000—.....															
Detroit, 115,000.....															
Syracuse, 55,000—year 1877.....?.....	714	12.98	229	120		25	22		9	3	16	1	73	1	58
Reading, 40,000—2 months ending Jan. 31.....	138	20.7	68	15		38			5		1		1		10
Sacramento, 21,000.....															
Minneapolis, 44,000															
Bowling Green, 6,000—.....															

Foreign.—United Kingdom of Great Britain. During eight weeks ending Jan. 5th, 46,070 births and 30,690 deaths were registered in London and twenty-two other large towns, and the natural increase of the population was 15,380. The mortality from all causes was, per 1,000, in London, 24.25; Edinburgh,

appreciate the benefit of that doctrine in explaining many of the hitherto most inexplicable problems of geology. Let it not be inferred, however, that Professor Le Conte in any degree shuns the exceptions to the theory of evolution. On the contrary, he often gives them special emphasis, *e. g.*, "the earliest men yet found are in no sense connecting-links between man and ape. They are distinctly and perfectly human, and even in many cases of far better conformation than the lowest types now living" (p. 564). The work is the more interesting from the circumstance that it is peculiarly American. Few geologists have had better opportunities than Professor Le Conte for studying the geology of America, or have had a better scientific training fitting them for it. Trained in scientific studies from an early age, as we learn from a recent sketch of him in *Popular Science Monthly*, first in Georgia and subsequently as companion of Prof. Agassiz on the keys of Florida. And, after taking the degree of B.S., in the Lawrence Scientific School, successively Professor of Natural Sciences—including Chemistry and Geology—in Oglethorpe University and South Carolina College, and next as chemist of the Nitre and Mining Bureau of the Confederate Government Laboratory. In 1868 he was elected Professor of Geology and Natural History in the University of California, a position he continues to occupy—the while extending his geological researches throughout the almost boundless and hitherto very little cultivated field of the Sierras, Western territories, and Pacific coasts. Hence the fulness of his work of American geology, and its special interest and value to American students and readers, for whom it is in particular designed, and to whom we earnestly recommend it.

Bogus Diplomas.—The "Philadelphia University," a concern founded

prudence comprehends too much to be covered by any one author, or any single work, hence it is gratifying to note that the attractiveness of the field is increased by its expansion, and that men of recognized learning in both medicine and law find in it an abundant scope for original research and demonstration, under the light of the most advanced collateral sciences. This work is by two authors, of such rare opportunities and learning, with such strong evidence of well tried and proven scientific research and skill, as to challenge the closest scrutiny—to know whether the high expectations we had formed of the work from its announcement, and the encomiums awarded it from a variety of sources, were justified. It is no disparagement of other comparatively recent learned works on the subject—Taylor's, Wharton and Stillés', and Guy's—to say that this last, by Woodman and Tidy, is the best, for it ought to be; while it by no means displaces the others or any one of them. Indeed, much of the excellence of the work under consideration is due to the free use the authors have made of the other works named, and other authorities in verification of their own researches and demonstrations; thus rendering their own work the more comprehensive, and correspondingly more valuable. For example, the chapter on "Systematic Chemical Analysis" for the most part consists of the comprehensive schemes of the late Dr. Letheby: a detail of the most exact chemical manipulation by one of the most eminently skilled and advanced of analytical chemists. The work is far from being a mere compilation, however. It in the main consists of original research and rehearsal. The want of space forbids even an enumeration of the subjects treated of in the thirty chapters which constitute the work. Toxicology is more thoroughly comprehended than in any other work hitherto published, and under a multitude of headings takes up nearly half the volume. The chapter on "Life Assurance," at this time especially, is eminently worthy of and *apropos* to the attention which that subject is now everywhere inviting. The chapter on "Insanity," by its numerous illustrations from a great variety of sources and circumstances, affords a solution of many of the most important questions which disturb the peace of alienists and others concerned for the most certain means of recognition. And of the rest it will suffice to state that almost everything treated of in other works on medical jurisprudence is here brought under review; and it has evidently been the object of the authors throughout to bring their work up to the latest and highest standard of scientific truth: they have eminently succeeded. We unhesitatingly commend it as a work of great value to all medical practitioners and lawyers interested in the subject of medical jurisprudence—and who of them are not? And as *a necessary work* to all who practise in criminal courts, and to all medical men who would not as witnesses appear in fear and trembling.

Le Conte's Elements of Geology* is a thorough adaptation of that science to the easy comprehension of the college student, and the long-felt want of the general reader; a résumé, void of abstruse reasoning and detail,

the London Hospital; Medical Officer of Health and Public Analyst for Islington; Vice-President of the Society of Medical Officers of Health; Master of Surgery; Late Deputy Medical Officer of Health and Public Analyst for the City of London, etc., etc. With Chromo-Lithographic Plates, Representing the Appearance of the Stomach in Poisoning by Arsenic, Corrosive Sublimate, Nitric Acid, Oxalic Acid; the Spectra of Blood, and the Microscopic Appearance of Human and other Hairs; together with 116 other Illustrations. 8vo, pp. 1083. Philadelphia: Lindsay & Blakiston.

*Elements of Geology: a Text-book for Colleges and for the General Reader. By Joseph Le Conte, Professor of Geology in the University of California. 8vo, pp. 588; 903 illustrations. New York: D. Appleton & Co. Price $4.00.

yet full in expression and clearness of description. Distinctly recognizing the two classes of works on the subject hitherto depended upon: the one being too elementary and insufficient, and the other too scientific—too much encumbered with scientific detail—and suited only to the specialist, the author has hit upon a happy medium; and written a book suitable alike to those who would lay the foundation for the further prosecution of the subject, and the necessary knowledge for the cultured reader. The subject is presented analogically as an organic unit: 1. The external form and structure of the earth—its anatomy, *structural geology*. 2. The action of physical and chemical forces; the action and reaction of land and water, of earth and air; and the effects of these upon the form and structure, the physiology of the earth—*dynamical geology*. Its earliest condition and progress of development, the embryology of the earth—*historical geology*. Each of these grand divisions, while kept in relation with the others, is subdivided under appropriate headings, and with the aid of a ready command of the collateral sciences, numerous diagrams, and unusually excellent cuts, is in such wise presented and discussed as to be deeply interesting and lastingly impressive. In particular is this the case with the third division—*historical geology*. The author accepts *evolution* as the key for unfolding much that has hitherto been in doubt, and this he keeps in view throughout, "making *evolution* the central idea about which many of the facts are grouped, . . . as a thread running through the whole history, sometimes very slender, some times indeed invisible, but reappearing from time to time to give consistency and meaning to the history." Whatever doubts may be entertained in regard to the truths of evolution in general, as applicable to organic nature, no one who reads this book will fail to appreciate the benefit of that doctrine in explaining many of the hitherto most inexplicable problems of geology. Let it not be inferred, however, that Professor Le Conte in any degree shuns the exceptions to the theory of evolution. On the contrary, he often gives them special emphasis, *e. g.*, "the earliest men yet found are in no sense connecting-links between man and ape. They are distinctly and perfectly human, and even in many cases of far better conformation than the lowest types now living" (p. 564). The work is the more interesting from the circumstance that it is peculiarly American. Few geologists have had better opportunities than Professor Le Conte for studying the geology of America, or have had a better scientific training fitting them for it. Trained in scientific studies from an early age, as we learn from a recent sketch of him in *Popular Science Monthly*, first in Georgia and subsequently as companion of Prof. Agassiz on the keys of Florida. And, after taking the degree of B.S., in the Lawrence Scientific School, successively Professor of Natural Sciences—including Chemistry and Geology—in Oglethorpe University and South Carolina College, and next as chemist of the Nitre and Mining Bureau of the Confederate Government Laboratory. In 1868 he was elected Professor of Geology and Natural History in the University of California, a position he continues to occupy—the while extending his geological researches throughout the almost boundless and hitherto very little cultivated field of the Sierras, Western territories, and Pacific coasts. Hence the fulness of his work of American geology, and its special interest and value to American students and readers, for whom it is in particular designed, and to whom we earnestly recommend it.

Bogus Diplomas.—The "Philadelphia University," a concern founded

for the propagation of quackery, continues to find dupes, who pretend to be authorities abroad, who mistake it for the *University of Pennsylvania*, and certify to its respectability.

Nature for January 3d contains the following: "A 'Dr.' Harmuth, in Berlin, who received his diploma from Philadelphia, was lately sentenced to pay 300 marks for using the prefix 'Dr.' publicly. It is but just to so old and respectable a university as that of Philadelphia to point out that 'Dr.' Harmúth's diploma could not have been genuine. So-called Philadelphia degrees of all sorts are sold by agents, but they have no connection with the *University of Philadelphia* (*sic*), nor have they at present any connection with the city, though the author of this scandalous imposition once lived there and carried on a disreputable practice as a quack doctor. The public should still be on their guard against bogus degrees, for diplomas purporting to issue from several American and German universities are still to be had, in some cases on examination *in absentia* and payment of the fee, in others by a money payment only."

C. M. INGLEBY.

Valentines, Dec. 26, 1877.

The Plumber and Sanitary Engineer—a new sixteen-page trade paper—is one of the most welcome of this year's additions to our exchange list. Chas. E. Wingate, editor.* "It aims to make every plumber a sanitary engineer." A hopeless task, we fear, in view of its own testimony, that "too many plumbers have no real practical capacity." But a chief object will be "to make public the best current information bearing upon this branch of industry, and to stimulate members of the trade to study and improve in their particular line of business, both as a matter of duty and interest." Such an object surely deserves well of the public, and we hope for the enterprise the patronage it well deserves. The number before us contains articles on "The Sanitary Aspect of Plumbing," by Geo. E. Waring, Jr; "Kitchen Boilers and their Care," by Thos. Read; "Design Showing Arrangement of Waste-Pipes and Traps," having in view the especial object of excluding noxious gases; "Familiar Talks About Gas and Gas Fixtures," and several shorter articles and paragraphs, of importance to all persons interested in such matters, either as furnishers or patrons.

Brainard's Musical World for February will delight any one interested in music. In addition to the usual forty pages of elegant new music, this number contains an illustrated extra, giving the history, full description, and a fine view of the grand new Cincinnati Music Hall.

The five pieces of music (songs and piano pieces) in this number would alone cost, in usual form, about $2.00, yet the *Musical World* can be obtained through any newsdealer, or of the publishers, for only 15 cents, or $1.50 per year, post-paid.

Quarantine, with Particular Reference to Cholera and Yellow Fever,* is a summary of commonly recognized conditions, particularly in the quarantine of New York, which the author thinks should be made general, together with authority for the establishment of better supervision of ocean travel outward bound and *en route*, as well as on arrival. These conditions, in connection with more energetic measures for the prevention of endemic homes of cholera and yellow fever, are urged as the essential means of preventing both origin and propagation.

*Published monthly. $1.50 a year. American Plumber Publishing Co. James Bunting, Manager, 297 Pearl street, New York. P. O. Box 3087.

*By John M. Woodworth, M.D., Surgeon-General United States Marine Hospital Service. Reprint from Transactions of International Medical Congress.

Books Received.—Mortuary Statistics, Mutual Life Insurance Co., New York; World's Fair—Francis A. Walker; State Regulation of Vice—Aaron M. Powell; Colds and Coughs—E. Symes Thompson, M.D.; Report of Louisiana State Board of Health, 1878; Narcotic Effect of Morphia on the New-born Child—W. R. Gillettee, M.D.; Medical Culture and Self-Protection—J. R. Black, M.D.; Atlas Essays, No. 3, reprint from the International—A. S. Barnes & Co.; Dogma of Human Responsibility, more especially as it relates to Inebriety—the Rev. J. Willet.

New Journals Received.—*La Independencia Médica.* Revista de Medicina y de Farmacia. Le publica los dias 1, 11, y 21 de cada mes. Precio de Luscricion; Estranjero y Ultramar, al año, 60 reales. Cambios y reclamaciones, dirigirlos al Administrador Dr. D. Laureano Sirarol. Oficina, Carmen 34, bajos—Barcelona, España.

La Salud. Semanario popular de intereses vitales, ilustrado con grabados, siempre que el caso lo requiera. Director-Propietario, José de Letamendi, Doctor en Medicina, Catedrático de Anatomia de esta Facultad, etc. Direccion y Redaccion—Barcelona, calle de la Merced, número 4, piso 2°, derecha. Administracion—Barcelona, calle de Robador, número 24 y 26, libreria.

Bericht über das Veterinärwesen im Königreiche Sachsen für das Jahr 1876. Herausgegeben von der Königl. Commission für das Veterinärwesen durch G. C. Haubner. Einundzwanzigster Jahrgang. Dresden: G. Schönfeld's Verlagsbuchhandlung.

Hygieiniske Meddelelser, Udgione af Dr. E. Hornemann og Prof. Gædeken Ny Række 2del Binds 1ste Hefte. Rejobenhavn: Jacob Lunds Boghandel, 1877.

O Progresso Medico. Redactor Principal, Dr. Domingos de Almeida Martins Casta, Miembro titular da Imperial Academia de Medicina do Rio de Janeiro, Cavalleiro da Imperial ordem da Rosa, medico da Casa de Laude de N. S. da Ajuda, etc., etc. Publica—se nos dias 1 e 15 de cada Mez. Rio de Janeiro, Typographia Academica Rua Sete de Setembro 73.

Annales de Demographic Internationale. Recueil Trimestriel de Travaux Originaux et de Documents Statistiques et Bulletin Bibliographique Special. Publié par A. Chervin. Paris Librairie de Guellaumin et Cie. Editeurs de plasieurs Journaux Scientifiques, 14 Rue de Richelieu. 1877.

Subscribers in Arrears are in particular invited to scrutinize this number of THE SANITARIAN. We know they will agree with us that it alone is worth the annual subscription price. We have a succession of like valuable material in store for them if they will only be kind enough to send us the little checks or postal orders necessary for us to continue it; otherwise not.

REMOVAL.

The Editor and Publisher of THE SANITARIAN has removed his office from 82 Nassau street to

47 Lafayette Place,
Opposite Astor Library.

Exchanges will please observe removal and correct address.

All Communications should be addressed:

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Other places and hours by special appointment.

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VENTILATION.

From advance sheets of a paper written for the Maryland State Board of Health, 1878.*

By W. C. Van Bibber, M.D., Baltimore, Md.

Summer Ventilation.—One way of ventilating is by opening the windows and doors in the proper way and at the proper times. It would seem too tediously minute to give further directions here, but the word *proper* has an extended significance in this connection. This kind of ventilation must be governed by the principles which have already been given, and also by common-sense, as well as by comfort and existing circumstances. It implies that the drainage around the house is sufficiently good to admit pure air for the purpose. In order to show practically the value of such ventilation, permit me to extract again from the letter before cited: "I will tell you what happened to a neighbor of mine last Summer. Mrs. M. had a sick infant about six months old. My daughter and myself went up one day to see if we could do them any good. It was in the hottest part of July. The same room serves the family for kitchen, sitting-room, and the baby—as sleeping room. The room was a long, narrow one, extending east and west, with two doors, one north, one south, but not exactly opposite. The cooking-stove was in the north-west corner of the room, the baby cradle in the north-east. One door they kept always shut, the other partially so, for fear the child might catch cold. The poor little thing was panting and gasping for breath, the mother pale and black under the eyes; the air of the room fœtid and miasmatic. 'What doctor attends that child?' 'Dr. D. Before him we had Dr. L. Then we tried Dr. H. I think we'll discharge him and call in Dr. N.' 'Mrs. M.,' I answered, 'that child is dying from want of fresh air. Did not the physicians employed suggest that remedy?' 'No, sir, not one; they did nothing but give it physic.' Then I took the husband out on the little porch (for the air inside was making me

* Concluded from page 106.

sick) and told him in plain Anglo-Saxon what I thought of the case and of the restorative effects of fresh air, and why country infants had so much better chance for life in summer than those of a city, etc. He listened with evident attention, and said he would act on it, and a day or two afterwards we walked up again and found both doors wide open and the child evidently on the mend. The last time I was there the doors were still open, the child was rosy and hearty, the mother had recovered her good complexion, and all the other children looked gay and hearty."

This every-day occurrence so graphically described may be taken as a text for some comments on Summer ventilation. If the air from the open doors had passed over a spot upon which "dish-water" and the general waste-waters of a family had been thrown for a long time, it would not have been healthy air to be brought into the house when the wind set in the proper direction for this purpose.

In malarious districts it is well known that a piece of woods, or other obstructions to the air coming from a certain place, as a swamp or pond, has an appreciably good effect in preventing malariaization. It is well to have a good weather-vane in such regions, and to watch the direction of the wind and act accordingly. Close up the house on one side, and keep it open on others. "To purify the air by fire," is a common expression, and one found by experience to be of great benefit in practice, when judiciously managed. The beneficial effect of fire may be to dry the air, since moist air is more likely to contain poisons.

In summer ventilation the art of cooling houses should not be neglected. Many contrivances for this purpose may be found. I believe that a house built double, *i. e.*, with an air wall; or a house within a house; or, to express it in another way, a house with a ventilating shell over it, would, if properly constructed, make a residence cooler in summer and warmer in winter. The air in the air-wall would be kept in a current from below upwards by the heat of the sun on the roof in the summer, and the force of this current might be assisted by bull's eyes of glass or other contrivances of glass properly arranged in the shell. This may be a valuable suggestion for many kinds of houses, both in towns and throughout the country.

Winter Ventilation.—It is impossible to treat of this subject without including that of warming also. A few practical hints will be given with a hope that they may prove useful. Amidst the great variety of ways for warming and ventilating dwellings and other houses, most persons are generally at a loss which to choose. The choice in the matter, however, not only affects health and comfort, but to a certain extent intellect and morals also, therefore nothing more need be said concerning its importance. Most of the inhabitants of this State live in small rooms. What is the best way of warming and ventilating them? Let us suppose a room 12 by 14, and 10 feet in height. I would select an open-mouthed stove, like a Franklin or Harvard stove, or a grate ten inches from the floor, thirteen inches in length across, eight inches deep at top, six inches at bottom, the bars seven-eighths inch from centre to centre. Soft, or bituminous coal, is the best fuel, and, if properly used, a ton and

a half will supply such a stove or grate during an entire season. If hard coal is used the air is too dry for comfort. This open fire both warms and ventilates a room. There are some gas stoves which may be substituted for them in cities.

On the 5th of September, 1846, John H. B. Latrobe, Esq., of Baltimore, obtained a patent for a stove which is now generally called "The Latrobe Stove," "The Baltimore Heater," or "The Fire-place Stove," etc. It is a fire-place stove, and the principle of its action in warming the rooms in the upper stories is so generally understood here, that any further description of it is thought unnecessary. There are now many patents connected with it. It is in large demand, and a great majority of the new houses, less than twenty-five feet front, are supplied with them, and almost entirely warmed by them. Of the 180,000 dwellings supposed to be under consideration, it may safely be assumed that the fire-place heater is used for warming at least one-sixth of them, viz., over 30,000. Thus it supplies the comfort of warmth to 150,000 persons, for whose benefit this paper is designed. It is, therefore, worthy of especial remark.

This stove is economical, convenient, always under observation, attractive, and highly popular. It warms the room in which it is set by radiation, and those above by "convection." The usual place for obtaining the air to be warmed and conveyed to the second or third stories is from the cellar. This is bad air—unless it is brought by a trough from the outer air, as in the original construction—and makes the heat supplied above both unhealthy and unpleasant.

The principles which should govern the use of hot-air furnaces or fire-place heating stoves are five in number, as follows:

First: The air to be warmed must itself be pure. Second: A sufficient quantity must be obtained for the number of persons it is intended to supply. Third: The warmed air must be constantly changing, *i. e.*, it must have an escape from the apartment. Fourth: To restore to the air what is taken from it during the process of warming. Fifth: To free the air from dust or other organic particles. A few words may be said in explanation upon each of these five principles.

First: The air itself must be pure. What is pure air? It is composed of three gases, viz., Oxygen, 23; nitrogen, 76; carbonic acid, 4-10 of 1 volume in every 1,000 volumes, and a variable amount of atmospheric vapor. The manner in which the atmospheric vapor is best explained practically is this: Let 100 represent the air saturated with atmospheric vapor, when it is more than this it will be precipitated as mist or rain, and then the number 65 will represent the amount of atmospheric vapor necessary for a healthy or comfortable atmosphere. It is important to bear in mind, however, that the vapor in the air, although the amount be small, is just as necessary for its comfort-giving property as the oxygen is for its life-giving property.

How can we know when the air is pure? By our reason, the sense of smell, and our feelings. Practically these are enough. It can be known by our reason from observing whence it is obtained. For example, would any one go to a cellar to obtain pure, comfort-

able, life-giving air? An inferior order of animal life is justly and properly associated with the air of cellars; such animals as lizards, snakes, snails, turtles, and toads. Contrast these with the animals immediately associated with the well-ventilated, dry, and sun-lighted air of plains and fields. This immediately suggests beautiful parrots, the agile deer, and birds of Paradise. The comparison is perfectly true, and should command most serious attention at present in this State. It is often said, "But *my* cellar is open, and the air in it is pure." It is like the farms in malarious districts. From the evidence of the owner alone no bad cellar can be found. There are many reasons why the air of all cellars must be more or less impure. Would any one voluntarily go into a cellar to live? In the country they are too often filled with decaying apples, cabbage, potatoes, or other vegetables, and are seldom cleaned; it is then they poison the occupants of the house. For these reasons, as well as others, the English hygienists, and our own also, recommend that the air to be warmed by the furnace or stove should be obtained from fifteen to twenty feet above the earth. This can be done by galvanized iron or tin tubes. A pipe of this kind, eight inches in diameter, will cost about thirty or forty cents per running foot.

When the air is not pure, the feelings soon detect it; impure air causes fulness in the head, giddiness, lassitude, and debility.

The second principle is, "the air should be furnished in sufficient quantity for the number of persons it is intended to supply." Each person should have at least 600 cubic feet of space, and then the question arises, what quantity of air must be supplied per head per hour so to dilute the products of respiration and transpiration, or of combustion in lighting an apartment, as to keep the air always pure and fresh? It is a physiological question of the greatest moment to determine how much air each person uses. It is found by calculation and experiment. It may be somewhat curious to know the data and the factors employed in the calculation. When one takes a deep breath, the air passes through the throat and windpipe, and then through about 17,000 bronchial tubes, into the air cells of the lungs. These air cells have been counted and measured—and there are about 6,000,000 of them. Each one measures about 1-75th of an inch in diameter. These air cells hold altogether 20 cubic inches of air. Each individual breathes 18 times a minute = 360 cubic inches = a box 8 inches square. Therefore each individual damages air to the amount of 16 cubic feet per minute = a box 2 1-2 feet cube. How is the air damaged? Here the calculation takes another turn. It is based upon the carbonic acid in the air. That which you breathe in contains 4-10ths of 1 vol. in 1,000 vols. What is expired contains 4 vols. per 1,000 of carbonic acid. The calculation then turns upon the laws of the diffusion of the carbonic acid with the other gases, and it is found that two thousand feet of pure air per head hourly must be supplied for each person.

In schools, court-houses, state-houses, churches, halls, theatres, dwellings, etc., all good architects will now supply this amount, if not prevented by builders or committees. The earliest recollections of many of the natives of this State about fifty years old, must be of an old log school-house, heated by a ten-plate stove,

and the scholars and teachers half asleep or stupid during a large part of school-time. At the present day things are better, but there is still great room for reform. What can be more important than the healthfulness of early education?

The third principle is "that the air, to be changed, must have an outlet from the apartment." It will be known how much air is being delivered into an apartment by finding out how much is escaping from it. The calculation is reduced to a simple form, and it is found out that each person should have eleven square inches of out-flow. It is easy to tell whether any ventiduct is an out-flow or an inlet to air, by the moistened finger, a candle, a feather, or any other light fabric. There is an instrument also for this purpose called the *anemometer*.

It is calculated that an ordinary-sized chimney or fire-place, when the draught is established up it at three miles per hour, will discharge from the apartment about twenty-eight thousand feet of air per hour. This being replaced by fresh air, would give a sufficient quantity for fourteen persons. Notwithstanding this, many of the new houses now being built for sale in this city are constructed without any fire-places at all, and almost the universal custom is with the ladies to close up the fire-places in the older houses. Nothing can be more injurious to health. I hear it constantly said, "The cold air comes down the fire-places." This is true, owing to the unequal weights of air at different temperatures; and when this is the case, that is, when the fire-place is an inlet of cold air, and not an outflow of the air already warmed and damaged by use, the only remedy is to establish the draught up the chimney by means of fire, not enough for purposes of assisting in the warmth of the apartment, but simply sufficient to insure a draught up the chimney of about three miles per hour. This is what is called forced ventilation by fire, and in this case the outflow should be near the floor of the apartment. But when the outflow is not intended to be forced by fire, the outflow openings should be near the ceiling. In this situation they are more likely to be effective.

The next principle is to restore to the air what was taken from it during the process of warming. It is the atmospheric vapor which was dried from it in the furnace or fire-place heating stove. Air, when too dry, gives great discomfort to most persons, and cracks all wood-work. Hence the moisture should be restored to the air before it enters the apartment. The most effectual way to do this is to place the register in a pan of water. This will restore the moisture. It is water applied at the right place, viz., just where the hot air comes into the apartment. An excellent contrivance for this purpose is a patent taken out by a gentleman of Baltimore; it is called the Register Evaporator.

There is an instrument for measuring the moisture in the air called the hygrometer, but nothing for this purpose can exceed the delicacy of a bouquet of freshly-cut flowers, except it be those yet more dear and more highly organized flowers, who droop and wither in badly managed warmed air, and I pity them.

The fifth and last proposition is to free the air from dust and

other organic particles; so to speak, to filter or strain the air, and break the solid force of its current. When sitting at a register upon a dry, windy day, I have often felt a puff of air heavily charged with dust blown in my face. This can better be prevented by placing a lady's veil over the inlet than by any other means with which I am acquainted. Fine wire screens have been tried, but do not answer the purpose. I would not insist upon this suggestion so strongly if the lady's veil was not the only fabric that I know of which will answer the purpose intended equally well. The nap upon the woof of the veil catches the dust, but allows the air to pass with freedom.

Let me repeat these principles. First: Get pure air to warm. Second: Get a sufficient quantity of it. Third: Restore to it what has been taken away during the process of warming. Fourth: See that the air is constantly changed, attend to ventilation; and fifth, strain from the air its city dust and organic particles.

Without *all* these things life can be sustained; for there are few houses in this State where all these principles are strictly attended to. But is it not a pleasure to attempt improvement? To advance with knowledge and avail of its teachings as it progresses? Is it not a pleasure to improve in health and vigor, or to retain these as an advance is made towards the summit of the hill of life? Is it not a pleasure to improve the intellect or the yet more beautiful qualities of the mind? All of these are influenced more or less by the air which is breathed.

In respect to ventilation there is no difference to be observed in buildings. What has been said for churches and school-houses applies to dwellings and state-houses as well, and to all inhabited rooms. The architect is as much bound to deliver the 2,000 feet of fresh air per head hourly as the coal merchant is to deliver good measure of coal to warm the air, or as the head of a family is to deliver sufficient provisions for each person to sustain life.

This much has been said concerning the warming and ventilation of dwellings by the Latrobe stoves, and other air-warming stoves and furnaces, because these are most commonly used in this and other States. This plan of warming and ventilating is adopted by millions throughout the country, and as now used is certainly injurious to health. Even those who sell and place these stoves admit the imperfections of the present plan, and regret they are not allowed to do more on account of expense. The addenda which have been mentioned are not expensive, and will amply repay those who will try them. In small houses, where the hot-air furnaces or fireplace heaters are used, the appliances mentioned are indispensable for health and comfort, and can be obtained for a small additional expense.

In the case of large houses, public or private, I would give preference to indirect radiation of warm-water pipes properly placed for regulating the general temperature of the house, and in the case of private dwellings, for the rooms chiefly used, and at least one upon each floor, I would provide properly appointed open fires. By means of these the house would be ventilated. In the expression

of this opinion almost the exact words of the late Dr. Henry W. Dean, of Rochester, N. Y., have been used.*

Window Ventilation.—The opening of windows "to air" an empty room or building is admissible; but to rely upon window ventilation for a crowded hall, school-room, church, court-house, or any other apartment, large or small, is now justly regarded with dread and horror. When the window of a hot room is opened, a solid stream of cold air pours in equal to the temperature, force, and direction of the wind, and is something frightful to experience. Those exposed to this current are in great danger of contracting disease. Ventilating railroad cars by opening windows is a frequent cause of illness. There are two patents, however, for the ventilation of a room through a window, which are efficient and agreeable.

Ventilation by Gas.—In England, "The Sun Lighting and Ventilating Company" stand very conspicuous in this admirable improvement. A patent for the same principle has been obtained in this country. It consists in placing the gas lights near the ceiling, and the heat, foul air, and products of combustion are conducted through a pipe into a chimney or flue. Examples of this may be seen at the Peabody Institute, and some private dwellings in this city; notably that of Mr. Deford's, on Cathedral street. All new houses should be built with this improvement, and it can be applied to any house with a moderate expense and temporary inconvenience.

A large part of the trouble about properly warming and ventilating private dwellings depends upon the neglect of one principle, viz., education; and the time is at hand when it is likely this will be remedied. Who is expected to care for the comforts of a house? and who can make it cold or warm, pleasant or unpleasant, at pleasure? Notwithstanding this responsibility, I constantly hear the ladies say that the flues, the chimneys, etc., being out of sight, are complete mysteries to them.

In olden times, when one fire in a house was the rule, and gathered around this domestic circle there was ever an open family discussion as to the proper placing of the fuel to the best advantage, some wishing to make the fire on top and others at the bottom, then this was the only education in house-warming either sex received or required. But now that the ways of warming buildings are more elaborate, the terms of the discussion have become deeper and darker, and the whole problem presents a different aspect, it is time to change the education also.

"Clothing, houses, and fires are the means by which mankind are enabled to inhabit the earth," says Mr. Briggs; and, in our State, as well as in all the Northern and Middle States of this country, owing to vicissitudes of climate, the comfortable management of heating and ventilating appliances may be regarded as so many compromises with the weather, demanding skilled arbitrators to nicely adjust the differences.

It is now quite fashionable in large female seminaries to educate the scholars in the art of cooking. It is as necessary to teach a boy how to dress himself and take care of his clothing as it is to

* Reports and Papers of the American Public Health Association, p. 329.

educate him in grammar, arithmetic, and manners. Females at present are taught the principles of anatomy, physiology, and other useful sciences; why should they not be educated in the art of warming and ventilating houses also, which has become one of the essentials of the day, and certainly belongs to their department? It is the common rule to allow more than twenty tons of coal for a hot-air furnace in an ordinary-sized dwelling, in this State, and with this supply a clumsy servant keeps the house over-heated during moderate weather. With the same appliances skilled labor can keep the premises comfortable in all weathers with half the amount of coal. The same kind of difference in management extends to the use of the Latrobe or fireplace heating stoves, as well as to steam and water heaters; and even if automatic valves and other mechanical appliances are supplied, no great change can be expected in these matters of discomfort and waste until the ladies lend their efficient aid to the subject.

Before closing the subject I wish to repeat that the object in writing this paper was more to excite an interest in ventilation than with an expectation of adding to its science. Every portion of the subject depends upon some principles of philosophy, the practical applications of which are often accomplished by those who have not studied their explanations. "Pure air is the bread of respiration," and a point most prominently insisted upon has been to seek where and how pure air can be obtained. It has been explained why this is a problem for out-of-door life, in some situations, between the months of June and November, and for life within doors during the rest of the year. Whatever effect these explanations may produce, it cannot reasonably be expected that they will have convincing power enough, or that my name will have influence sufficient to have them all carried out immediately. For example, When will the board fences be removed from around the yards in our cities and towns? Who will set the example? Who will brave the ridicule, the contrariety of interests and opinions, and it may be the popular anger, in such a matter? The older inhabitants are too set in their opinions and averse to change to advocate it, and the younger ones have neither the means nor the power to act. Yet, with full confidence, it may be asked what one thing would tend to purify the air or to beautify a city or town more than this? Under the existing circumstances, during the summer months, where can good air be obtained for ventilation in the cities and towns without some improvement of this kind?

It will be said by some persons who may read this paper that life can be sustained and health kept unimpaired without all of these things which have been recommended. No doubt this is perfectly true in individual cases; but, on the other hand, it cannot be denied that the public health, that is the kind of health which is intended to be provided for by State medicine, is not at a high standard throughout this country. Would it not be a pleasure to see the people of a nation improve in health and vigor, and to observe its citizens of all classes retain these to the end of a long life?

Malaria enlarges the spleen, changes the color and function of the liver, ruins the complexion, blunts the sharpness of the mind, and by causing many other changes deteriorates the entire man. Whatever can be suggested which will prevent these effects must be valuable everywhere.

The Government of the United States should surely take care of Washington city, its own home, in the same manner as empires, kingdoms, and other forms of government have cared for their resident capitals. "Like the general, so is the army." When the most learned and eminent men of an intelligent country visit their capital city, they should find it a model provided with the newest improvements of the time, so that knowledge may thus be disseminated by practical illustrations. The inhabitants of the metropolis and capital of the State of Maryland should fully appreciate their rare opportunities, for, besides being seated around their own Gamaliels of knowledge, they are gathered close under the down-feathers of the general government's wings, and hence should pride themselves upon adding their quota to the nation's advancement.

Finally, I may say, it is highly proper the Government of the State should take some cognizance of the important question of ventilation, and that it should foster every effort to improve the hygiene of its citizens. It is, therefore, wise that discourses on such topics should be brought before the people through the public documents, and I can have no doubt that the selection of this subject of ventilation will be productive of much good.

The Government should be a great father to improvements and advancing ideas, striving to guide a numerous family, as near as possible, to the distant realms of perfection and happiness; and what better effort could be made than that which instills an abhorrence for foul and loaded atmospheres, and teaches the necessity and blessing of good, pure air?

Pretty well, thankyou.—"Why, how d'y'do, Mrs. Careful—are all your folks pretty well?" asked one neighbor of another, whom she met in Hempstead a few days ago. "Oh, yes, pretty well, thank you—that is, about as well as usual. Father hasn't been quite well since he banked up the cellar last fall, and overworked himself; thinks he hurt his side. And mother has got the rheumatism so bad she hasn't been able to get down stairs for a week; Matilda Ann has a slight touch of the diphtheria, so the doctor says; Jimmie can't speak above a whisper, for a sore throat. Susie is just getting another rising in her ear, and the baby has had two more spells of croup. My husband can hardly do any work on account of his sore eyes, and I thought I'd die last night with neuralgia in my head—but we're all about as common. How's your folks?"

THE PRESENT POSITION OF SANITARY SCIENCE, FOR ITS FUTURE PRACTICAL ADVANCEMENT.

ADDRESS ON HEALTH.*

By EDWIN CHADWICK, C.B., President of the Health Section.

Normas of Sanitation obtained by Improved Civic and Private Constructions.—I now proceed to notice the normas of sanitation evolved by local or private effort for the protection of civic populations.

In about thirty of the smaller towns sanitary works were attempted by local authorities on lines adopted by our first General Board of Health for systematic sanitation, namely, by the removal of damp by the drainage of sites with permeable agricultural drains; by pure supplies of water, if possible from spring sources, delivered direct into houses on the system of constant supply, without cisterns and without waste; by the constant removal from within the house of all putrescible or fœcal matter by the water-closet, together with all the fouled water from the kitchen or the laundry, from the house, through self-cleansing house drains; by the constant removal of such matter from beneath the site of the town through self-cleansing sewers, and by the constant and direct application of all such foul or waste matter as was removable in a liquefied form (perfectly fresh), or free from advanced decomposition, as manure on to the land for agricultural production. There was to be no stagnation anywhere, no time given for advanced decomposition, and no production of putrid-sewer gases to be discharged either into the houses or into the streets, or above them into the general atmosphere. Normas of the self-cleansing sewers, and of the application of the sewage to the land, were separately considered, and separately established at great pains. Trial works were got, as to the forms, sizes, and inclinations of channels that should be self-cleansing with the least quantity of water. Our objective points of sanitation were, first the house, next the street, then the town area, and last of all the river. It was established that, as a rule, pure supplies of water could be brought to the door for rates amounting to a penny per week, and carried into the house for another penny per week; and the waste water of the scullery or the laundry removed for another penny; and the cesspit abolished, and the water-closet added for another halfpenny, or in the whole threepence per week, or a halfpenny per diem, for a complete system, in which there should be no putrid-sewer gases, and in which you might test the competency of the sanitary engineer by the smell.

* At the twenty-first Annual Congress of the British Social Science Association, Aberdeen, September 13th, 1877. Continued from page 56.

We showed that three houses and three towns could be sewered well, at the cost heretofore incurred for draining one town ill, on the old plan of brick drains of deposit and large man-sized sewers of deposit, which were only extended cesspools for the generation of putrid-sewer gases.* At these prices works were done then, and, allowing for the advanced price of labor, may be done under competent administration now. To this work for the removal of putrescible matter, from within houses and from beneath streets and towns, was added the covering of footways and the roadways of streets with some impermeable surface, and the cleansing of it by a jet of water, from a hose and hydrant, to be used on occasions for the extinction of fires. In blocks of houses and whole towns cesspools have been removed, and water-carriage through the water-closet, with self-cleansing drains and self-cleansing sewers, have been substituted. Physicians in practice in such localities have testified on their experience that, house to house as the improvements were completed, and the atmosphere of the house was altered, low headaches were removed, the appetites improved, and the symptoms premonitory of advanced disease were abated, and that their practice was largely affected. But it is difficult to get satisfactory statistical estimates of the results, because they have not been appreciated or regarded by the ignorant local authorities, and the returns are not available distinctly for the houses where the suffering from alterations have been made, and even in respect to the towns where such works have been effected, the registration includes outlying houses and undrained detached villages, which are unimproved. Nevertheless, in the statistics for the places where the works have been carried out in principle, even in a rudimentary manner, reductions of death-rates by one-fourth, and even by one-third are frequently shown. In 1866, an examination of twenty-five of these towns was made by the Medical Department of the Privy Council, but without a due knowledge, as it appeared to me, of the nature of the works or of what was to be expected from them, or of their defects. It came to my knowledge subsequently that the works of some of them were grossly defective, and wretched houses, rooms, and room tenements had remained unimproved. Nevertheless, the general results obtained were reductions of the general death-rates (after excluding small-pox and infantine epidemics) about 12 per cent., of typhus fever 41 per cent., of phthisis in a number of cases more than 40 per cent., and of diarrhœa a mean of 18 per cent., and a reduction of the general death-rate of more than 9 per cent. The commentary by Mr. Simon on these results was that "they

*Some of the principles were first developed under the Metropolitan Sanitary Commission, 1848, and in trial works carried out in that and the next year under the Metropolitan Sanitary Commission. As to the principles of water supply they were expounded, in the report on the Supply of Water to the Metropolis in 1850; next, in the "Minutes of information on the drainage of land forming the sites of towns, in the drainage of suburban land, and on road drainage," issued by the General Board of Health in 1852, also "Minutes of information on the removal of soil water and the drainage of dwelling-houses," and "Minutes of information on the practical application of sewer water to agricultural production," issued by that Board during the same year.

may serve to fulfil very important provisional uses, not only to confute persons who have despaired or affected to despair of any great preventibility of disease, but still more to justify in the public eye and to encourage in some of the noblest of human labors, those who for long weary years have been spending their powers in this endeavor, and to whom it will be the best of rewards to see the demonstration of the good they have wrought."

More is to be lamented for the good that has been frustrated than is to be rejoiced at for the shortcomings obtained, and it will be proper, in the interest of the future, to display hereafter the obstructions continued against the complete and extended applications of settled principles of sanitation. But for the present I must confine myself to the showing the progress of the power of sanitation, and the demonstrations of such distinct normas as have been got. For the reasons heretofore stated, I deem the available statistical evidence derivable from the experience of whole, even of improved towns, at present insufficient to display the full power of sanitation. In my experience, however, the statistics may be inferred from the aspects of the places, and from the aspects of the people. After traversing different districts and observing the difference of their conditions as to cleanliness, drainage, and other sanitary points, when I have been enabled to get out the statistics of the death-rates street by street, I have found they have corresponded closely to what might have been anticipated from their relative conditions. Nay, from the contrasts of the classes of destitute orphan children in the district half-time schools, I could anticipate, where there were marked contrasts in their conditions, very much of the different death-rates of the places whence they came. And here I would mention an experience from my own observation. I have been in the habit of visiting those institutions at long intervals of time. At a late visit to one of them I was struck with the improvement of the type of the children. I observed to the manager, "Why, you have a different class of children to those I last saw here. Where do they come from?" The answer was, "They come from the same districts, the lower districts; but since sanitary improvements have been made in those districts we are getting a different type of children, as you see." I found that the medical officers, as well as managers of other institutions, confirmed these observations by similar experiences. Others than myself have made the observation that since the clearances of bad dwellings and the wider spreading of the habitations of the wage classes in Paris, that they are changing that leathery complexion—so much like the inner soles of old shoes—which they formerly had for one clearer and fresher. Such changes are in accordance with our anticipations, and it is satisfactory to observe distinct appearances of their realization for future promise of large improvements in the types of populations.

I should anticipate with confidence from such appearances a reduction of the death-rates to be marked by statistics if they were got out. The blocks of model dwellings in London, erected by voluntary associations, present better observed and clearer instances, serving to some extent as normas of the preventive power of sanition. In these the death-rates range separately from 14 to 17 per

1,000. I assume that in the metropolis 16 per 1,000 may be taken as the mean death-rate of similar improved habitations; that, I need not say, is an important advance upon the general death-rate of 23 in 1,000. But a death-rate, which is a mean of the deaths of a large city, is almost always a delusive misrepresentation, especially of the extremes. Thus we have part of a sub-district in London, comprising houses in good condition, where the death-rate does not exceed 10 in 1,000, whilst there are adjacent dwellings, chiefly occupied by the wage classes, where the death-rates from year to year keep up to the extent of 38 per 1,000 Important returns, with which I am favored by Dr. Russell, the medical officer of health of Glasgow, show for the last year a range of death-rates from one district at 15 in 1,000, to another district at 40 in 1,000. Now, a mean of these two, or the general routine mean (25 in 1,000, with sub-districts of 17, 24, 26, and 33 in 1,000) is a misrepresentation of each. It has lately been proved that in some of the dwellings condemned under Mr. Cross's Act the death-rates were as high as 50 and 60 in 1,000. It has been objected to the conclusions from the lower death-rates in the model dwellings that the people living there are generally of a better class in position and habits. The answer is that if the same people were taken into the inferior tenements their habits would deteriorate, as the habits of artisan families from the rural districts deteriorate, whatsoever may be the increased amount of wages they obtain. But the power of sanitation is displayed upon people of the lowest condition and habits in the metropolis—namely, the tramps who occupy the common lodging-houses regulated under Lord Shaftesbury's Act. These places were formerly distinguished for the first outbreaks of typhus and epidemic diseases. Drainage, water supply, and the means of cleanliness and ventilation are now enforced, and overcrowding is prevented in them, and they are now distinguished by an immunity from common epidemics. Medical officers of the districts where these lodging-houses are situated have testified to the better sanitary condition of their occupants than of the wage classes dwelling under the jurisdiction of the common vestries. Dr. Russell states to me that "in the large model lodging-houses of the corporation a case of fever is the greatest rarity, and it never spreads. In the common lodging-houses belonging to private individuals we have fever oftener, but there again it never spreads," that is to say as it does in defective houses of the wage classes. "We are informed of a case at once, and remove it immediately to the hospital. Fever of any kind never spreads in any of our institutions where I can do as I please to cut it short." Why should not similar protection be extended to the wage classes? Accepting my norma of sanitation in the prison, Dr. Russell says: "If I had perfect command over all the Irish in Glasgow, as the governor of a prison, I would reduce the death-rate one-half in five years, and in less time than that I expect." On the whole, death-rates in the model dwellings may be fairly placed in opposition to the common death-rates prevalent amongst the wage classes of the metropolis where it is upwards of 30 in 1,000; or, as an example, of a gain of one-half upon that special death-rate by the power of sanitation. His majesty the King

of the Belgians has offered an international prize which is calculated to be of high service as conducing to a better determination of the power of sanitation and its vindication before Europe. He offers "a gold cup of the value of 5,000 francs to that municipal or local authority, or private association, which shall, by an improvement of the dwellings of the wage classes, effect the greatest reduction of their death-rates at the lowest cost." I have been informed of instances of model dwellings on the Continent where a lower death-rate has been attained than of those in London. But an instance is stated by Dr. Tatham, the medical officer of Salford, which, if correct, would gain the cup for England. It is of a block of model cottages, a model village, erected for the workpeople of Messrs. Price & Co., near Liverpool, where the average death-rate for the last five years has been 8 in 1,000.

On a review of the facts I have adduced, I think I have proved that by sanitary measures under such regulations it is quite possible considerably to reduce the common death-rates. I state that we can so arrange common conditions to multiply the most fatal orders of disease, and that we can command conditions as to induce them as effectually as to prevent them. If I might resort to the Hindoo mythology, as formulating or embodying maleficent and beneficent principles, I may say that if Siva the Destroyer were to require it, we could certainly build a city in which we could ensure a death-rate of 40 per 1,000, or far more than double the general mortality of the country. For that purpose we should copy literally and closely the old parts of Whitehaven, those of Newcastle-upon-Tyne, and the wynds of Glasgow and of Edinburgh, which I have heretofore traversed, and some edifices in Paris and Berlin, and some tenement houses and crowded slums reported of in New York and Boston. We can reproduce conditions of damp and of filth, and of darkness and of confined stagnant air, and induce the specific diseases found in those conditions. I have asked relieving officers in London whether they could take a dozen cabs and fill them with fever cases, of which particular cases they had received no previous notice. Yes, they replied; they could readily find enough, though they might not be quite sure of the sort: the cases might be of typhus, they might be scarlet fever, they might be measles, they might be small-pox. But some cases of the eruptive diseases they were sure to find. Let those places be looked to and copied. There were instances even of particular houses which the medical officers were sure would be the first to be attacked on any renewed epidemic visitation. There was one house, or street, in York, which, as we were informed by tradition, was the first attacked by the great sweating sickness; then the first by the great plague, and lastly the place which cholera selected on its first visitation to this country. On the second visitation during my service we had an outlook whether the place would be true to its traditions, and it was so! Let that be copied. As a short cut to get at the places for sanitation, I have instructed sanitary inspectors to go into the primary schools, to put aside the most squalid and inferior children, ascertain their residences, and examine them. They have done so, and as a class they have found the most

wretched tenements to be the fever nests of the city. I remember that Dr. Lyon Playfair, then a pupil in sanitation, told me that he had with other visitors acted on this suggestion, and noted amongst the class of squalid children two whose faces were blotched from disease. They found that their habitation was over the confluence of a discharge of putrid sewage. Let such places, too, be included. By copying these places and repeating these conditions with fidelity, we may ensure with certainty that more than half those born shall be in their graves by the fifth year, and that those who survive shall be stunted, squalid, irritable, and weakly. We may, by such unsanitary conditions, reduce the proportion of the aged and of the middle-aged and of persons of mature experience, and increase the proportions of the young and of persons of immature experience to the rest of the community. We may reduce the steadying influence of experience and augment the preponderance of passion, and of blind impulse. We may, by the excessive sickness and death-rates, produce a sense of the shortness of life, of its pains and its worthlessness, and generate a reckless avidity for immediate gratification; such as that which characterizes inferior soldiers in time of war. We may, indeed, compound a "hell broth" of "powerful trouble" to the police, as well as to the administrators of relief to human misery. We may produce such results; for they are produced from such conditions, and are displayed in outbursts that alarm and endanger the negligent administrations under which they have arisen.

On the other hand, if the beneficent principle worshipped as "Vishnu the Preserver" should command, we can undertake to erect a city which shall in time be the reverse of all this, and in which the death-rate shall not exceed 10 in 1,000, or one-half of the general average of sickness and mortality; a city which shall be as fever-proof as we have made our orphan half-time asylums and our prisons, without, indeed, materially altering the popular habits except as to overcrowding; with houses freed from the cesspool smell, from the bad drain and the sewer gases, from the damp wall and from the foul wall smell, and from wall vermin; from stagnant and vitiated air, and from the too prevalent exclusion from sunlight —houses that should, by their construction, be cool in summer and warm in winter, with good water supplies undeteriorated by bad modes of delivery.* I say with confidence that we might ensure an advance upon the normal death rate of 15 or 16 in 1,000 of the present model dwellings; because those dwellings are in my view not yet up to the principles of construction, as the Prince Consort's model dwellings were, in some important points.

Moreover that reduced death-rate of 16 in 1,000, as against 40 or more, good though it is, must be considerably affected by the condition of the general urban atmosphere in which they are situate, as well as by particular unsanitary conditions. As to the general urban atmosphere, surgeons will be aware that if an accident re-

* *Vide* for particular exemplification my Report "on the dwellings characterized by cheapness, combined with conditions necessary for health and comfort," as displayed at the International Exhibition of 1867, at Paris, presented to Parliament, 1868, vol. 2.

quiring a serious operation were to occur to the occupier of any of those urban dwellings, his chances of recovery would be considerably improved by removal into a purer suburban atmosphere. With respect to the conditions of urban and country hospitals, a celebrated physician remarked: "In the city hospital-ward the most expert surgeon cannot cure; whilst in the country hospital-ward the greatest bungler cannot kill." Of the particular unsanitary conditions to which the occupiers of these urban model sanitary dwellings are mostly exposed, are air tainted with sewage-gas from bad general drainage, and indeed much sewer-tainted water by the dung-dust of ill-cleansed streets, befouling skins and clothes,—the children being compelled to go to long-time schools, and to be massed together with filthy-skinned children, the centres of children's epidemics, and by the adults being compelled to labor in ill-conditioned workshops not under the Factories Regulation Act. By the elimination of these unsanitary conditions, a reduction of the death-rates of the model dwellings by full one-third may be confidently assured. It might indeed be anticipated that some approach might be made as to children to the condition of the half-time schools, or as to the adults to the sanitary conditions of those great normas of sanitation, our prisons;—that is to say, a condition in which two years out of every three there should be, as it were, a sanitary jubilee, in which there should be no disease, and no death; a condition under which all men shall attain the promised term of threescore years and ten.

It is not, however, necessary to wait for the construction of Hygeias to make advances in urban sanitation. What has already been done in old cities, such as Salisbury, where the death-rate has been reduced from some 28 in 1,000 to 17 and 18 per 1,000; what has been done with the common lodging-houses; what has been done with blocks of buildings in the metropolis and in Glasgow, warrants the conclusion that specialists as sanitary engineers might now contract for the attainment of important sanitary results. I am confident that data might be given for the reduction of the death-rate of the metropolis from 22 to at the most 17 in 1,000, and for the reduction of the death-rates of provincial cities in the manufacturing districts in yet greater proportion. I am confirmed in this anticipation by the facts obtained from recent returns from Glasgow, where efficient sanitation has lately been applied, and where in one well-to-do district an urban death-rate of 23 in 1,000, or about the mean of the metropolis in 1871, has been reduced to 17 in 1,000 in 1876. In another district the death-rate has been reduced from 29 to 26, in a third from 35 to 26, and in the worst district from 44 to 33; the mean reduction in that city being from 33 to 25 within that period. I am nevertheless of opinion that by vigorous and complete sanitation a further reduction of 9 to 17 deaths per 1,000 is practicable in that city. Aberdeen, with a death-rate of 20 in 1,000, is in the fore of Scotch cities; but I believe the death-rate to be reducible there, by complete sanitation, to 14 in 1,000.

Excessive sickness involves premature working disability, as premature mortality and excessive pain and misery involve definite

pecuniary loss which the political economist may estimate. On definite data, I have heretofore estimated the money loss from unsanitary conditions at about £15,000,000 sterling per annum. It must, however, be much more than that. Happily this sum capitalized would, under economic rule, amply suffice, in most cities, to defray the expenses of proper works by which the existing unsanitary conditions might be removed and a pecuniary gain in productive power effected.

(*To be continued.*)

Mining Mortality.—Statistics compiled by one of Her Majesty's mine inspectors show that of the deaths that occured in mining in Great Britain between 1850 and 1860, 20.36 per cent., or about one-fifth, were due to fire-damp explosions; 39.87 per cent., or about two-fifths, were due to falls of the roof and sides of the mine; 17.24, or less than one-fifth, were due to shaft accidents; and 22.53, or more than one-fifth, originated in miscellaneous causes and accidents above ground. In the first ten years after the inspection of coal mines was instituted the total number of deaths was 9,090 from all causes, being within 1,000 of the total number of deaths estimated to have occurred in all the antecedent annals of British coal mining. On the face of it this seems either to vitiate entirely the estimate that only 10,000 deaths occurred up to 1859, or to prove that neither the appointment of inspectors nor all the accumulated and valuable resources at the command of the mining engineer have been able to reduce the fatalities among our mining population.

The following table is given to show the ratio of fatal accidents to the number of men employed and tons of coal raised:

Year.	Fatal accidents.	Men employed.	Tons of coal raised.
1861	943	289,478	86,039,214
1862	1,138	....	81,638,338
1863	907	....	86,292,215
1864	867	307,542	95,112,919
1865	984	315,451	98,911,169
1866	1,484	320,663	100,728,681
1867	1,190	333,116	103,077,743
1868	1,011	346,320	104,566,959
1869	1,116	345,446	108,008,482
1870	991	350,894	112,875,725
1871	1,075	370,881	117,439,251
1872	1,060	418,068	128,348,178
1873	994	471,840	128,680,131
1874	991	508,032	126,540,106
1875	1,161	525,843	133,306,486

An addition of the above figures brings out the fact that during the fifteen years ending with 1875, 15,908 lives were lost in raising 1,608,576,193 tons of coal.

In our own country the corresponding figures for 1874 and 1875 for the Schuylkill district were:

Year.	Fatal accidents.	Men employed.	Tons of coal mined.
1874	78	15,080	5,157,853
1875	58	15,233	5,000,000

Ratio of deaths to tons of coal raised in 1874, 1 to 66,126; in 1875, 1 to 86,207 tons; in Great Britain, 1874, 1 to 133,251 tons; in 1875, 1 to 118,730 tons.

FINE FLOUR.

It is amusing to observe the way some people go trudging along fighting phantoms all their lives. Man is naturally a pugnacious and destructive animal; and when nothing better affords, he will wage a merciless war on some opinion, or some practice, it matters not which, so long as he has something to fight and overcome. There are people who will even construct opinions for the sake of combating them, and others who will continue to oppose opinions and practices long after both have fallen into desuetude. The sight of Don Quixote charging upon a windmill, in the full belief that it was some enemy, would probably prove amusing to the average spectator; but scarcely less ridiculous are the furious assaults made by well meaning but badly informed philanthropists upon that great enemy of mankind, fine flour. At least they deem it an enemy, and keep up their crusade against the insidious foe which is destroying the digestive powers of our stomachs, and doing other things equally horrible to contemplate. The time was when there was some need of such attacks. The middlings were excluded from the flour, and the percentage of starch which was incorporated in it was disproportionate. But now, although this evil has been remedied by the New Process, and the flour of to-day contains a larger percentage of gluten than ever before, our well-meaning hygienic philanthropists must have something to battle against, and accordingly New Process flour is denominated by some as the crowning outrage of artistic skill upon the stomachs of the human race. Such attacks, of course, have their foundation in ignorance of the New Process and its products; but as many of them have appeared in our contemporaries' and in our own columns of correspondence, it may be well to examine a little into the facts of the case and see whether they justify the statements made with such confident plausibility.

Man has always sought to improve his food, and any improvement in his civilization has been marked by some advance in the manner of manufacturing flour and making it into bread. Without any regard to the constituents of the wheat berry, man has ever aimed to make his flour and bread as white as possible. It is only within recent years that he has ever stopped to inquire whether he was utilizing the most healthful constituents of the wheat; his sole object has been to make his bread white and palatable, leaving the hygienic side of the question to take care of itself. Illogical and perverse as this may have been, he has survived it, and, if we may believe statistics, is considerably stronger and healthier than his ancestors of several centuries ago. Not even when shown his error has he recanted; but has continued to nourish his antipathy against dark bread. The miller is but the reflex of public taste. He grinds for his neighbors rather than for himself, and consequently it has

been his aim, too, to make his flour as white and fine as possible. In pandering to the taste of his fellows has the miller aided in perpetrating a physiological sin? Let us see.

Formerly the miller used to put down his burrs as closely as possible, grind as closely as he could without pulverizing the bran, and bolt out as much as possible, excluding the bran and middlings. Flour made in this way would contain from eight to twelve per cent. of gluten, and about seventy-five per cent. of starch. Now this flour was quite white and made white bread. But there was a large percentage of the wheat remaining unutilized, from ten up to twenty per cent. in some cases, which was in the shape of middlings. How to utilize this product, which was, with the methods then in vogue, available only for a low grade of flour, became a leading question with the miller. At last he struck a happy idea. He ground higher, obtained more of these middlings, purified them, and made them into his best quality of flour. He tested the flour and found that it contained from fifteen to twenty-five per cent. of gluten, and a proportionately less amount of starch. Here is an increase of nearly fifty per cent. in the most valuable constituents of the flour, and the miller, though accidentally, is a greater benefactor of mankind than the whole race of the disciples of black bread.

This is the whole question. In hunting down New Process flour as an enemy to health, our reformatory friends have displayed more zeal than science. It is not our purpose to argue in this connection the relative value of bolted and unbolted flour; but the same sophistry shown in dealing with New Process flour is manifest in the whole logical fabric reared by our bran-eating brethren. Just as they have rashly concluded that New Process flour is composed principally of starch, so have they, with an equal want of logic, inferred that by leaving the bran in the flour they would obtain everything of value in the wheat. We have shown that New Process flour contains relatively a larger percentage of gluten than the wheat from which it is made, so that it is really stronger than an equal portion of unbolted flour. But the question comes up, are all the constituents of unbolted flour available for the purposes of nutrition?

It is not denied that many valuable substances compose the bran and other matter which are excluded from the flour of to-day. Magnesia, potash, and phosphoric acid are substances required by every healthy organism, and in possessing these the bran of the wheat berry appears at first glance almost suited to form a part of our food. But we must not draw our conclusions too soon. Wood-ashes, bones, and a number of minerals might be named as possessing the same ingredients as the bran, and yet even our philanthropic hygienics would stand aghast at the prospect of feeding on such diet. Moleschott, a noted German scientist, devoted considerable time and study to this subject, and the conclusions he drew were that the use of unbolted flour was a mistake. He says that although bran is richer in nutritive matter than bolted flour, nevertheless a man cannot fully digest the thick cells of the hulls unless he possesses unusually strong digestive powers and leads an active life. He states, moreover, that the mucous membrane of the digestive organs becomes greatly irritated by the bran, and thus un-

desirable results attend an abundant supply of substances which, though highly nutritious, are digested with difficulty or not at all.

In view of this fact, it might be well for the opponents of fine flour to cease prating about the decayed teeth, weak nerves, and soft bones of those who persist in eating white bread, and turn an inward glance upon the condition of the membranes of their own stomachs. In the meanwhile the world will probably go on in its perversity and keep on eating fine flour, while the miller will continue to rack his brain to make the flour whiter and finer. We do not claim that the miller is a philanthropist, but we consider it apparent that in his efforts to perfect his art he has conferred signal though unexpected blessings upon the race.—*American Miller.*

Death in the Dishcloth.—A lady correspondent of the *Rural World* having been startled by *typhoid fever* in her neighborhood some time ago, gives the following good advice about dishcloths:

If they are black and stiff and smell like a barnyard—it is enough—throw them in the fire and henceforth and forever wash your dishes with cloths that are white, cloths that you can see through, and see if you ever have that disease again. There are sometimes other causes, but I have smelled a whole house full of typhoid fever in one "dishrag." I had some neighbors once—clever, good sort of folks; one fall four of them were sick at one time with typhoid fever. The doctor ordered the vinegar barrels whitewashed, and threw about forty cents' worth of carbolic acid in the swill-pail and department. I went into the kitchen and made gruel—I needed a dishcloth and looked around and found several, and such "rags!" I burned them all, and called the daughter of the house to get me a dishcloth. She looked around on the table. "Why," said she, "there was about a dozen here this morning," and she looked in the wood-box and on the mantelpiece and felt in the cupboard. "Well," I said, "I saw some old black rotten rags lying around and I burned them, for there is death in such dishcloths as those, and you must never use such again." I took turns at nursing that family for weeks, and I believe those dirty dishcloths were the cause of all that hard work.

Therefore, I say to every housekeeper, keep your dishcloths clean. You may only brush and comb your head on Sundays, you need not wear a collar unless you go from home—but you must wash your dishcloths. You may only sweep the floor when the sun gets right; the windows don't need washing, you can look out of the door; that spider's web on the front porch don't hurt anything—but as you love your lives wash out your dishcloth. Let the foxtail grass grow in the garden (the seed is a foot deep anyway), let the holes in the heels of your husband's foot-rags go undarned, let the sage go ungathered, let the children's shoes go two Sundays without blacking, let the hens set four weeks on one wooden egg—but do wash out your dishcloths. Eat without a tablecloth, wash your faces and let them dry, do without a curtain for your windows and cake for your tea—but for heaven's sake keep your clean.

MENTAL RESPONSIBILITY, AND THE DIAGNOSIS OF INSANITY IN CRIMINAL CASES.*

By E. C. MANN, M.D.

Proceedings of the New York Medico-Legal Society, January 2d, 1878.
HON. G. H. YEAMAN, President, in the Chair.

We will now consider briefly the medico-legal importance of *epileptiform attacks* which may be partial in character and which may not reach convulsive activity except so far as the mind is concerned. These attacks *always display* periodicity, and *after* the paroxysm there is an intermediate stage, during which in most cases the person remains in a confused state perhaps for some hours, and is apt, subsequently, to retain only a vague and general notion of the preceding events. Thus in a homicide by shooting, the murderer would be likely to be roused by the sound of the pistol-shot and to remember it, although he would not very likely remember the altercation at all, or what passed between them. A case occurred recently of considerable interest from a medico-legal point of view, in which a murder was committed during an epileptiform seizure, or rather, more strictly speaking, during a state of transitory moral epilepsy, which was the result of a previous sunstroke, the immediate exciting cause being an attack of illness and the taking of a small quantity of alcoholic stimulus, which it is well known acts as a poison upon persons who have been sunstruck. This state of "moral epilepsy" is a morbid affection of the mind centres, which destroys the healthy co-ordination of ideas, and occasions a spasmodic or convulsive mental action. The will cannot always restrain, however much it may strive to do so, a morbid idea which has reached a convulsive activity, although there may be all the while a clear consciousness of its morbid nature. The case just referred to had complained of pains in the head and sleeplessness, which had displayed marked periodicity, and which had been accompanied with great irritability of temper excited by trifles and seemingly unconnected with personal antipathies. As has been previously stated, the person alluded to had been suffering from quite a severe illness, and, after taking a small quantity of alcoholic stimulus, went out to walk. He met a friend with whom he had been familiar for years, and a discussion arose as to the respective merits of certain politicians, when, the discussion becoming excited, the man pulled out a revolver and shot his friend. He then went in a confused and dazed state and sat for some hours upon a dock near a river, and subsequently went home and burst into tears, and informed his wife of the sad occurrence, and gave himself up at the police station. There was no simulation of insanity by pretending to be incoher-

* Concluded from page 125.

ent, or by strange actions, and no attempt either on the part of himself or wife to pretend that the act was an insane one. There was, however, a total blank in the prisoner's mind respecting the events immediately preceding the pistol-shot, which seemed to have aroused his attention for the time; and he had no recollection of the fact that he sat on the dock for some time afterwards, as he was seen to do. The writer was consulted as an expert, and upon ascertaining the prisoner's previous history gave it as his opinion that there had existed for months previous to the occurrence a profound moral or affective derangement, which from its marked periodicity was evidently epileptiform in character, and that the sudden homicidal outburst supplied the interpretation of the previously obscure attacks of recurrent derangement. There had evidently been induced by the sunstroke in this case an epileptiform neurosis, which had been manifesting itself for months, chiefly by irritability, suspicion, moroseness, and perversion of character, with periodic exacerbations of excitement, all foreign to the man previous to the attack of sunstroke. It is well known among specialists in insanity that this epileptiform neurosis often exists for a long time in an undeveloped or marked form, and that this neurosis is, moreover, connected with both homicidal and suicidal mania. Such attacks often are noticed to occur periodically for some time before the access of genuine epilepsy. I have often witnessed in cases under my charge abortive and incomplete epileptiform attacks where there were no convulsions and where there was no complete loss of consciousness. I have noticed in such cases either a momentary terror, slight incoherence, a gust of passion, or a mental blank, the patient perhaps stopping in the middle of a sentence. The patient would then be himself again, quite unconscious of what had happened to him. Accompanying this confusion of ideas may be, as I have remarked, instantaneous impulses,* either of a suicidal or homicidal nature. This class of patients I have always found irritable, easily excited, very emotional without adequate external causes, easily losing their train of thought, and often unable to collect or fix their thoughts. Such cases have told me that they felt themselves changed in character, and have acknowledged that they often felt impelled to strange and violent acts by some power which they could neither understand nor resist. Such patients may entertain delusions of fear and persecution, and commit criminal deeds, as a result of such delusions. When such cases, in their terror or distress of mind, commit some violent deed, they either experience immediate relief—as was the case with one patient under my care, who was only relieved by suddenly breaking out a pane of glass

*Owing to the writings of Highlings Jackson, Maudsley, Russell Reynolds, Hammond, Trousseau, Faliet, Esquirol, and others, epileptic vertigo is a recognized disease. There is abundant testimony to show that during such seizures persons may perform actions, and even speak and answer questions, automatically. There are numerous examples in the works of the above authors proving that in an unconscious condition persons can progress from odd or eccentric actions to deeds of violence, suicide, or murder, being unable to remember the circumstances afterwards, *and therefore irresponsible for their actions.*

when his paroxysm would subside; or they continue in a state excitement unconscious, or very imperfectly conscious, of the gravity of their acts. When they become conscious again, their memory is apt to be very uncertain as to preceding events. Griesinger says, "Individuals hitherto perfectly sane, and in the full possession of their intellects, are suddenly, and without any assignable cause, seized with the most anxious and painful emotions, and with a homicidal impulse as inexplicable to themselves as to others." Maudsley says, "Let it be borne in mind, then, that there are latent tendencies to insanity which may not discover the least overt evidence of their existence except under the strain of a great calamity, or of some bodily disorder, and that the outbreak of actual disease may then be the first positive symptom of unsoundness." The question as to the degree of mental responsibility attaching to such cases is one of great interest to psychologists and also to jurists, and one to which it is hoped in the future much more attention may be directed than has been given to it in the past.

In closing this paper I propose to consider very briefly the tenability of the position which has been assumed by some jurists, and also, I am sorry to say, by some medical men, relative to criminal cases, in which it has been asserted that it is the habit of counsel to retain medical experts as special pleaders—not to give an impartial scientific opinion, but to concoct the most ingenious case for the defence. Before criticising such assertions I would remark, what is already known to most of the medical and legal gentlemen present, that the men who obtain the most correct theories of human conduct; the men who discover in the highest degree the secret springs of action; the men who penetrate the most deeply into the mysteries of human delinquency, do so by the study of morbid psychology in that broad and liberal manner which is possible only amid large collections of the insane, and are the men who have been accused, as I have stated, of being in the habit of prostituting their scientific opinions. I would remind such critics that imperfection, deficiency, or obliquity of human conduct are generally supposed at the present day by the greatest thinkers to be the result of organic influences, and the revelations of character so often found on the records of our courts can be cleared up in no degree except by the profound study of organic conditions, in connection with abnormal mental phenomena. By the aid of such study history and biography would be read by the aid of a new light, and it would be seen that much of what is called genius is the result of a morbid organic activity; and that the saints, heroes, and martyrs of history have become such more by virtue of a peculiar temperament than by the profound sense of moral or religious obligation; and also that many of the horrible crimes classical in history have proceeded rather from cerebral disorder than a native thirst for blood. The expressions of contempt and disgust which have characterized the remarks of the critics of medical experts, we take it, are owing to the fact that they do not always display invariable unanimity of opinion on questions of mental pathology whenever they appear on the witness-stand. Discrepancy of opinion to such critics evidently implies incompetency, to use the mildest term, and it would seem to appear that they expect

of experts nothing short of omniscience and infallibility. The stand which has been taken by such persons shows a great want of intelligent thought on the subject, for it is about as reasonable to expect from medical experts invariable unanimity of opinion on the witness-stand as it would be to suppose that every judicial decision expressed the united opinion of the full bench, or that the followers of physical science should be unanimous regarding all points in science. I venture to say that there is no scientific study which ensures any nearer approach to unanimity of opinion among its followers than does that of insanity. In alleged cases of insanity different alienists truly and faithfully declare the results of actual observation, while the subject matter is often regarded from various points of view. One expert may arrive at the conclusion that the person is not insane, while another, guided by a class of cases that have come under his notice, though perhaps scarcely known to the other, sees indications of insanity in certain acts or traits that otherwise he would have regarded as merely the singularities of a sane mind. The objections of such critics depends on a complete ignoring of the exact purpose of skilled testimony in judicial proceedings. I enjoy the honor of the acquaintanceship of many of our most eminent experts, and I have never yet seen a case where judgment has been warped or perception of truth dulled or modified by the fact of compensation. Such opinions as have been given have been, so far as the writer has known, honest and conscientious. It is doubtless true that there are men who labor under the infirmity of supposing that a little actual knowledge warrants them in claiming a great deal they do not possess, and that thus opinions are foisted upon the jury utterly unworthy of their confidence; but that this is the case with medical experts deserving of the name I utterly deny. The class of persons whom I have alluded to severely criticise the theory which supposes that a man may, under the influence of periods of abnormal cerebration—of sudden and transitory mental disorder—commit criminal acts, and immediately afterward undergo a sudden transition to a normal state of cerebration. Such persons cannot be familiar by experience, I think, with the first symptoms of approaching mental derangement—with its sudden exacerbations and reasoning unreason—and cannot know how little power of control there often is over suddenly arising morbid ideas or impulses, or they would be more careful about denying the irresponsibility of the actions of persons displaying such impulses. Such persons consider moral feeling from a mental standpoint, and without reference to its connection with physical structure; but, as I have previously remarked, moral feeling is a function of organization, and cannot with propriety, I think, be separated from it. One of the very earliest symptoms of insanity, as most alienists are aware, is a complete deadening and perversion of the moral sense, and this symptom often ushers in mental derangement which subsequently exhibits intellectual impairment and decay, the disorder running through the various phases of insanity, and terminating in dementia, organic degeneration of the brain, and finally death. In irresistible impulse, which has a shorter duration than transitory mania, to which it is allied, we shall generally find hereditary

taint, which establishes partially its claim as a separate and independent form of insanity. It has a shorter duration than transitory mania, and a perfect recollection is retained of what takes place during the paroxysms, and it has no apparent cause; whereas we can detect cerebral congestion in transitory mania, which generally can be traced to intemperance or epilepsy, as in the case I have previously mentioned. I have traced in patients suffering from irresistible impulse, where the disease, for disease it is, consists in the blind impulse, and where there is often a terrible struggle maintained between the deliberation and directing powers and the overpowering morbid will, a premonitory stage, which has consisted either in general malaise, insupportable general feelings of weight, distress, anxiety, fear, or local sensations in the head. Sometimes trivial external causes provoke the outburst of fury. Patients have confessed to me that irresistible homicidal impulses have taken possession of their minds wildly and forcibly, and in instances where the intended victim has been a person regarded with strong affection. The contest which is often maintained between two spiritual personalities in the same individual is at times terrible, as in the case of a hypochondriac who, in dread of yielding to a homicidal impulse, cut off his arm. That such irresistible impulses are disease, and are dependent upon physical changes, is proven by the fact that, like other forms of nervous disease, they are cured, sometimes, on the establishment of puberty, sometimes by work or occupation, and sometimes by a powerful moral shock; also it is proved by the fact, which I have before alluded to, that there are often the same precursory symptoms which attend other forms of the neuroses, such as exalted sensibility, neuralgic suffering, sleeplessness, difficulty in fixing attention, and many vague, indefinable sensations.

I have endeavored, as well as I have been able, to present a series of psycho-physical disturbances which more or less affect the soundness of reason and which also affect, in various degrees, spontaneity. I have tried to demonstrate states of constitutional disturbance, under which, I think observers will agree, it is difficult to conceive how the intellect can act either calmly or clearly, and, in closing, can only express the wish that this subject will in the future be established on a sound basis by the united labors of the medical and legal profession of our own country; and I think it can hardly fail to do so, under the cognizance of so many gentlemen already eminent for their advance in psychological discrimination.

Money Value of Lives.—Basing the estimate upon the agricultural classes of Norfolk, Dr. Farr values the life of an infant at birth at twelve dollars and a half, in its prospective labor. Five years later his value as a productive agent is one hundred and thirty dollars; and five years later, it is more than doubled. At the age of twenty-five he has attained the maximum value—six hundred and fifteen dollars a year. At fifty the value is reduced down to three hundred and forty-five dollars, and so on down to seventy, when the value is only two dollars and a half a year. Should he live to eighty, his value is one hundred and two dollars less than nothing.

PURE WATER.

To the Editor of THE SANITARIAN:

Your paper on Garden City in the March number of THE SANITARIAN suggests a comparison of the natural conditions and sanitary provisions of that place with those of Baltimore.

Situated upon the elevated plateau of an island, and consequently inaccessible to any running streams from more elevated regions in its neighborhood, Garden City depends for its supply of water upon that which is held in a natural reservoir beneath the surface; and which is afforded by a thick bed of ocean sand, pebbles, and shells, resting upon a tight bottom of blue clay or hard pan. So long as there are no objectionable deposits or flows capable of penetrating the surface of this territory, such water must be of the highest degree of purity; since it is received directly from the clouds, and filtered through the clay and sand, it can contain only the few matters in solution which are derived from this deposit from the sea, such as soda, magnesia, and lime, and in quantities just sufficient to impart an agreeable taste; which absolutely pure water never has. But if a city is built upon this site, depending upon this source lying beneath it, the authorities must exert an eternal vigilance, not only upon their own community, but upon adjacent territories for long distances around. All effete and other obnoxious matters must be rigidly excluded from penetrating the ground and be transported to a distance.

The city of Baltimore, although situated over a deposit of similar mechanical character, is attended with conditions which make the sanitary regulations exactly the reverse. Its supply of water is derived from a stream of equal or greater purity, which enters the city at an elevation sufficient to be drawn from pipes at the tops of the houses, and in quantity affording five hundred gallons per diem to each of its present population.

So far from using the substratum as a source of supply, it is made to perform the office of a general sewer. And so far from expending care and labor in preventing the unclean matters from entering the ground, nearly every house is provided with a well for the express purpose of discharging in the most direct, rapid, and unobserved manner possible all such matters into the water-bearing stratum beneath. They disappear without being perceived as rapidly as they are produced, and, consigned to a region whose depth and low temperature annul every offensive quality, they are thus transported to a distance by the ever pressing flow of waste water from the pipes.

Such at least is the case with all those houses whose owners have the intelligence and economy to avail themselves of the advantage; and such can be the case throughout nearly the entire city when the authorities compel all citizens to a compliance with

a law which their own interest would require to be enacted; that is, wherever practicable, a well penetrating through all clay or other impervious material and reaching the water-flowing gravel.

There are some locations in the northern and elevated sections where the gravel deposit disappears and is replaced by the solid rock; but they have but little extent and are in the immediate vicinity of the stream which flows through the city, and which must necessarily be its *cloaca maxima*. In such cases sewers must be substituted for the wells, and be made to discharge into this stream. The short distances and their rapid descent will render them nearly as efficient in every sanitary consideration.

At present a large portion of the population are unprovided with these necessary arrangements; and the consequence is that the surface soil is saturated with, and the gutters are flowing with what ought to be instantly cast into the chill and darkness of the subterranean flood. Another large number, through a false economy, have wells of little depth, which terminate in the clay or other nearly impervious stratum; and the consequence is that the contiguous ground for a wide extent becomes saturated; and, being subject to the heat of the surface, gives forth a constant manifestation of a noxious decomposition. It is not such a decomposition as occurs in the harbor when the same matters are drowned in an excess of water, and emit the pure elements combined with hydrogen, such as hydro-sulphuric acid, etc., but that which evolves an organic vapor, the proper hatching medium of those mysterious germs which bring forth the zymotic diseases.

It needs only intelligent legislation and police regulation to establish the most perfect sanitary system, and an expenditure no greater than has been made without the slightest resulting benefit, to make Baltimore the healthiest, purest, and cleanest city in the world.

For these views, as well as those relating to sewerage contained in my paper on "The Causes of Local Insanitation in Baltimore," I am indebted to my good friend Mr. Richard Randolph, C.E., of this city.

Very faithfully yours,

JOHN MORRIS, M.D.

Baltimore, March 7th, 1878.

Health and Talent.—It is no exaggeration to say that health is a large ingredient in what the world calls talent. A man without it may be a giant in intellect, but his deeds will be the deeds of a dwarf. On the contrary, let him have a quick circulation, a good digestion, the bulk, thews, and sinews of a man, and he will set failure at defiance. A man has good reason to think himself well off in the lottery of life if he draws the prize of a healthy stomach without a mind, rather than the prize of a fine intellect with a crazy stomach. But, of the two, a weak mind in a herculean frame is better than a giant mind with a crazy constitution. A pound of energy with an ounce of talent will achieve greater results than a pound of talent with an ounce of energy.—*Home Journal.*

UNSANITARY CONDITION OF THE PUBLIC SCHOOLS OF BROOKLYN.

Abstract of a Report made to the Medical Society of the State of New York, January 16th, 1878.

By A. N. Bell, M.D., Chairman of Committee on Hygiene, Kings County Medical Society.

The number of school population in Brooklyn, from five to twenty-one years of age, on the ratio of the most recent census report, is about 180,000. The number attending the public schools at some period of the time during the last year was a little upward of 90,000. The number of pupils on register October 31st was 52,741, and the number of school-houses, including hired rooms for temporary use, under direction of the Board of Education, 55.

In the month of April, last year, the reporter, as Chairman of the Committee on Health of the Board of Education, sent to the principals of all the public schools of Brooklyn a form containing the following series of questions: How is the building heated? Is the heat well distributed? Is there sufficient heat in the coldest weather? What provision is there for giving moisture to the air? What provision for ventilation? What is the condition of water-closets and privies? Are they offensive? Are they connected with the sewer? What is the provision for the supply of drinking water? And for the several departments and classrooms: State whether the class is on first, second, or third floor? Is the light sufficient at all hours? Is the light in front, at side, and which side, or back of class? Are the seats adapted to the size and comfort of pupils? In cold weather can the room be kept warm and the air pure? Do you depend upon ventilators, windows, or both for ventilating? Number of pupils in room? Cubic feet of air space to each pupil? Square feet of floor space to each pupil? Average temperature, taken at 9, 12, 1, and 3 o'clock, 4 1-2 feet from the floor? Does teacher or pupils complain of headache? How many pupils have weak or sore eyes? How many absentees on account of illness for the month ending April 30th? etc.

From the returns made, actual observation, and records of the Board, it appears that the total area of school-house room in cubic feet is 6,558,600, which, if it were all occupied, would give an average of 124 cubic feet of air space to each pupil registered (52,741). But a considerable amount of the estimated space, particularly in buildings hired for temporary use, and some of the new school-houses, is unoccupied. Estimating the space necessary to each pupil to be 150 cubic feet of air space and nine square feet of floor space, of the whole number of public schools—forty grammar, six primary, four colored schools—thirty-five were found to be

overcrowded, chiefly in their primary departments, in the aggregate to the extent of 14,000 pupils; while in the higher classes of the grammar departments there is space in excess equal to 4,000 sittings. A condition due to the common and bad practice of building large three-story school-houses, and appropriating two-thirds of the space —two floors—to the grammar departments, and one-third to the primary departments; while the relative ratios of the pupils belonging to these departments is the reverse; there being about twice as many children belonging to the primary as to the grammar departments.

The overcrowding in the primary departments is simply revolting. It sinks to the low extreme, in two rooms, of fifteen cubic feet of air space, and two square feet of floor space to each pupil. Several rooms, with from seventy-five to one hundred pupils and upwards, and some of them in dark basements, have less than twenty-five cubic feet of air space and only three to four square feet of floor space to each pupil; and of rooms which give less than fifty cubic feet of air space and less than five square feet of floor space to each pupil, there are about fifty; an average of at least one such room to every school-house.

This state of things is the more remarkable from the circumstance that, in the same schools where this daily smothering is practised in the primary departments, there are rooms in the grammar dapartments where the area of air space is from two hundred to three hundred (and in some cases over four hundred) cubic feet, and over thirty square feet of floor space to each pupil—actually ten times as much room, in proportion to the number of the pupils, in some of the grammar departments as there is in the primary departments.

In many school-rooms there is a great want of light; in others it is in excess, and in very few is there any attention paid to the direction from which it falls upon the pupils at their desks. In some rooms it strikes glaring full in the face; in others the rooms are literally lighted on all sides. There is, in short, in the construction of our school-houses in this regard, apparently no attention paid to the required proportions of window space and floor space for school-rooms.

Of the warming appliances, they are generally by steam, after the manner known as indirect radiation. There is commonly sufficient warmth. As measured by the thermometer, there is no rule. The thermometer is supplied on the requisition of principals, and there are a few who have it recorded and the temperature kept at about sixty-eight; but there are many teachers who pay no attention to it, and so the temperature is irregular. Moisture to the atmosphere as a necessary appendage to the means of warming in many of our schools seems never to have been thought of, and there seems to have been no recognition of the injury to the health of the children consequent upon its neglect

Ventilation by the ordinary plan of unheated tubes open at the bottom only, in cold and wet weather requiring windows to be closed, and when ventilation is most necessary, is frequently deficient, and in many cases wholly inoperative. Facilities for drink-

ing water are, with but few exceptions, very deficient and defective; in several schools faucets are in the yard only, in bad weather requiring dangerous exposure on the part of the children.

Of the privies and urinals, they are briefly: insufficient, filthy, and dangerous to both physical and moral health, revolting to decency, and a public shame.

To a report by the Committee on Health to the Board of Education in June last, of which this is in part a recast, the following resolutions were appended:

1. *Resolved*, The seating capacity of all school-houses, school and class-rooms of sixteen feet height of ceiling, shall be limited to nine square feet of floor space and one hundred and fifty cubic feet of air space for each occupant, and it is hereby made the duty of all principals of schools and departments to distribute pupils on this basis, and to refuse admission to any school or class-room in excess of the seating capacity as thus defined and limited. In rooms of less than sixteen feet height of ceiling, the ratio of floor space shall be proportionately increased.

2. *Resolved*, No cellar or basement room with floor below the level of the contiguous street or streets shall hereafter be used or permitted as a school-room.

3. *Resolved*, The situation and area of windows of every school-room hereafter to be constructed or provided shall be as follows: No window shall be less than three feet six inches from the floor, exclusive of the frame, nor more than ten inches from the ceiling, including the frame, and the area of window space, clear of frame, shall not be less than one-sixth nor more than one-fifth of the area of floor space. And with regard to the direction from which the light should fall on the pupils, the windows and seats of all class-rooms shall be arranged, preferably, in the following order: first, from the left; second, from the back; and third, from the right; in no case shall the windows and desks be so arranged or permitted as to allow of the light striking the pupils directly in front.

4. *Resolved*, in view of the unsuitableness and insufficiency of our school-houses to the actual needs of the children, as shown by the present arrangement and classification—the overcrowded primary departments and the abundance of space in the grammar departments—regrading and consolidation of the grammar classes is eminently necessary, and alike essential to public economy and the best interests of at least three-fourths of the school children.

5. *Resolved*, All warming appliances for school-houses and school-rooms not now provided with means for supplying moisture to the air, shall be so provided without unnecessary delay; and all janitors and engineers, or other persons in charge of the warming appliances, shall be directed and enjoined to keep the same supplied with water at all times while the fires are lighted.

6. *Resolved*, All school-houses shall be provided with facilities for drinking water equivalent to one faucet and three drinking cups for every one hundred pupils, and at least one-half of this provision shall be under cover.

7. *Resolved*, All school-house privies and urinals shall be in separate apartments, and each shall be petitioned off and provided as

follows: In the male department there shall be at least one privy seat and one urinal stall for every twenty-five pupils; and in the female department at least one privy seat for every sixteen pupils.

8. *Resolved*, No privy or urinal shall be situated in the basement or cellar of any school-house or school-room; and all those which are now so situated shall be removed without unnecessary delay.

9. *Resolved*, All janitors' quarters within school buildings shall be and hereby are abolished; this resolution to go into effect at the opening of the next school term in September.

(Signed) A. N. Bell, *Chairman.*
A. W. Shepard.
J. W. Hunter.
Joseph Burger.

At a recent meeting of the Board of Education the report above referred to and the foregoing resolutions were taken up, and, excepting the 7th, action on which was postponed on account of the absence of the chairman of the school-house committee, and the 9th for want of time, were, with an amendment to the first—based on *expediency*—adopted. It was the general sense of the Board that the first resolution was right. But in view of the necessity of excluding 10,000 children from the public schools until such time as the Common Council may be impressed with the necessity of making the needful appropriation for additional school accommodation, it was amended so as to read:

"The seating capacity of all school-houses, school and class-rooms, of sixteen feet height of ceiling, *ought to be* limited to nine square feet of floor space and 150 cubic feet of air space for each occupant. *And it is hereby recommended that all local committees, as soon as practicable*, reduce the number of pupils to conform to this basis. In rooms of less than sixteen feet height of ceiling the ratio of floor space should be proportionately increased."

The other two resolutions will probably be adopted hereafter.

The effect of the conditions above described on the health of the school children in Brooklyn may be inferred from the fact that over 3,000 children disappear in the interval between the time of entering the sixth and promotion to the fifth grade in the primary department (one to two years), and, as suggested by the following contribution from the Registrar of Vital Statistics, is due probably to the unsanitary condition of the public schools:

Scarlet Fever and Diphtheria in Brooklyn.—By Francis H. Stuart, Registrar of Vital Statistics. The prevalence of scarlet fever and diphtheria in this city in an epidemic form for many months gives occasion for bringing before the Society certain facts bearing upon these diseases, shown by the records and brought out by the investigation of the Health Department. In relation to scarlet fever the records of death show that during the past six years this disease has prevailed without intermission. But each year there has been a marked remission during the third or summer quarter of the year. This being a highly contagious disease, and one of the so-called "preventable" diseases, makes this a striking fact in connection with its prevalence in this city. A precisely similar remission has been observed in New York by Dr.

Harris, late Registrar of Records in the Health Department there. In each of the other quarters of the year, the number of deaths has been from two to four times as great during the third quarter.

During the current year (1877), in the second quarter there were 267 deaths from scarlet fever, an average of 20 1-2 per week. In the third or summer quarter there were 144 deaths—an average of 11 per week. Looking at the deaths each week of this quarter there is a marked decline from the beginning of the quarter to the last week but one, when there is a sudden increase. The first week of the quarter there were 16 deaths, and the twelfth week 3 deaths. But during the last week of the quarter there were 12 deaths, and since then an average of 11 deaths per week. A possible explanation of these facts is suggested, viz., that the disease is spread by the association of children in the schools of this city, and chiefly by this means. There is the period of marked decline during the summer vacation, following closely on the close of the schools, the first of July. As soon as the schools opened, the disease increased its ravages each year. It reached its highest mortality during its first quarters—just as would be expected—the two generations of the disease producing a large progeny. This explanation may not be correct. I have not the data in regard to any other city than New York. Other influences may be at work. Statistics of English cities do not show any marked difference in the various seasons. Indeed, in some cities, scarlet fever has been most fatal in the summer quarter. But even this fact would tend to confirm the idea above, for it eliminates the conjecture that the period of open-air life would tend to prevent the spread of the disease.

Diphtheria caused during the past two years an aggregate of over twice as many deaths as scarlet fever. It has prevailed most in the seasons when scarlet fever was most fatal. The two diseases often occur together, and unite in causing death. The opinion is here offered that scarlet fever is the first developed disease. But the system being enfeebled by it, the excretory functions of the kidneys and skin being checked, and the forces being in a state of hyperæmia, the patient succumbs to the influences producing diphtheria, which else would be resisted or thrown off. In short, in the majority of cases, scarlet fever is the primary disease which, under unfavorable surroundings, becomes diphtheria. In the certificates of death received during the past year, the simultaneous recurrence of the two diseases is less frequently mentioned than during the previous year. During the seasons of 1876 and 1877 inquiry among the physicians showed that diphtheria most frequently produced a marked depression of the nervous system, and that death was oftenest caused by exhaustion. This year the type is somewhat changed, and the fatal result has most frequently been produced by obstruction of the air passages. There is prevalent at this time an unusual amount of disease of the throat. The fact that the changes of the atmosphere have been frequent and marked should be remembered in this connection.

In regard to the causes of diphtheria, several extreme cases led to careful examination of the premises. In one case a close, unven-

tilated cellar made five persons victims of this disease. In another sewer traps were made useless by the overflow pipes emptying below the traps. In most cases some such cause is found, foul air enervating the system making the subject susceptible to a slight exciting cause. That the disease may be contagious is not denied. But it is not apt to be contagious unless the system is already in a condition predisposing to it. Healthy, vigorous people, unexposed to debilitating influences, and merely coming occasionally, or for a short period, in contact with the disease, are almost certain to escape contagion.

These statements are made, not because they are thought to be new ideas, but rather to be suggestive to those who meet the disease in practice.

———o———

Art-Education of Women.—The thorough art-education of women is a thing which had not been thought of twenty-five years ago. Thus it came about that no being on earth is so helpless as the reduced lady; and it is to the assistance of reduced ladies that the South Kensington Museum Association has devoted itself, teaching women to embroider so perfectly that even the Roman Catholic Church, that great purchaser of embroideries, will buy the work, and she is a very particular purchaser. The ecclesiastical embroidery is a special art by itself. Chasuble, cope, and alb, robe, and carpet, and altar-cloth, and drapery, must be so deftly done that the microscope itself can detect no flaw. There is no finer, richer illuminating in an old missal than some of this embroidery. The face of Christ is painted by some devout needlewomen in silk almost as Leonardo de Vinci painted it in oils.

Tapestry is the work of both Arachne and Penelope. It is woven first, and then embroidered, or else in the weaving a shorter thread is thrown across, and the pattern comes out in fresh colors, of a different weft. Many ladies now emulate Matilda in the Bayeux tapestry, and use, as she did, coarse brown linen for the groundwork, and design, as she did, their own patterns. Turkish toweling is a favorite background for these tapestries. A great tendency toward cheap things, and a sudden discovery that the cheapest fabric and the most perpendicular sunflower, or the straighter cattail, is more artistic in combination than the wreath of splendid lilies thrown across satin—all this is the surprising discovery of modern art-decoration. Some of us take the liberty of doubting the wholesale assumption of the modern Eastlake, pre-Raphaelite, and South Kensington schools. Some of us still love luxurious French brocatelles and Japanese silks, heavy with gold and silver; but we are in an inglorious minority. A coffee-bag embroidered with cat-tails is "higher art."—*From Appleton's Journal.*

Editor's Table.

Asphalt Pavements.—It has been a subject of special gratification to us that an editorial on pavements in our December number has elicited much attention from various municipal bodies, and several special inquiries for a more particular account of the best results hitherto obtained in the use of asphalt for city pavements. To satisfy these inquiries we have taken some pains to identify, as far as practicable, the various "asphalt" pavements which have fallen under our observation in New York and Brooklyn, since the time of their first introduction, about a dozen years ago. We have had the Fisk, the Hoyt, the Scrimshaw, the Evans, the Day Vulcanite, the Parisien, the Burlew, and a number of other companies; and their pavements have all failed, leaving our streets strewn with their unsightly debris. The only companies which have left pavements as worthy mementoes are the Abbott, the Grahamite, and the Neufchatel.

The Grahamite Company laid a sample of pavement three or four years ago, about two hundred feet long, on Fifth avenue, New York, near the Worth monument, where it has been subject to a great deal of travel; it has worn well, although it is at present in need of repair. The same Company laid another sample, about four hundred feet long, on Eighteenth street, near Fourth avenue, which also has done well. Some of the other pavements of this Company, on the Mall in Central Park, in and around Reservoir square, and the Battery, have cracked badly and may be regarded as failures.

The Neufchatel Company proposed to lay the same asphalt pavement as that of Paris, importing the Neufchatel asphalt from Europe. This Company paved a portion of the footwalks in Union Square Park. It was a very nice pavement when new, but cracked considerably; it did not, however, crumble and disintegrate like the Grahamite, and, excepting the cracks, does well for footpaths. In Paris and London this pavement for roadways is considered a success, doubtless due to the difference in climate from this country—to the extremes—to which it is less suited.

Another Company gained some celebrity from having paved the Centennial grounds in 1876. At the first, some of that pavement appeared to be good, but more of it was poor; it soon began to fail, became soft and spongy, and seemed to show that while the

Company was capable of doing good work, it lacked the skill or experience necessary to secure uniform results. We have heard of some work by the same Company in Pittsburgh, some three or four years ago, but know nothing of its present condition.

The Abbott Company of Brooklyn laid their first pavements in that city about ten years ago. At first, some of their pavements proved very unsatisfactory; there was much doubt and some denunciation; asphalt pavements in general were by many regarded as failures. But this Company kept faith with the public authorities, and persevered; they made good what they did wrong, and have constantly been improving their methods and their machinery, until now they take hold of a street, finish a mile of pavement in about two weeks, and make the whole of so uniform a quality that after two and three years' use there are no defects whatever; and some of their pavements have worn for six and eight years with but slight repairs, and are still in good condition. These are the Abbott *Improved* Pavements.

They have proved so much superior to the pavements of all other companies in Brooklyn as to have completely supplanted them and won the hearty endorsement of the most intelligent citizens and largest tax-payers; insomuch that for the last two or three years the Abbott Company of Brooklyn have literally had no competitors. The Company have in every way shown themselves to be reliable, and the public authorities have wisely preferred employing them to resorting to a competition which hitherto has had no better result than to put ignorance and inexperience in competition with skill and experience, followed by the usual results of such maladministration.

Not much of any asphalt pavement has been laid in New York for several years on account of its failures on first trial; but the Trustees of the New York Hospital, who opened their magnificent new buildings on Fifteenth street near Fifth avenue a year or two ago, selected the Abbott pavement, for its noiseless and antiseptic qualities, to pave the street in front, and the alleys in and around the premises. It is an admirable sample, and will probably lead to a new trial by the city authorities.

All pavements, whether of wood, stone, or Macadam, such as the kinds common to New York and most American cities, which permit the filth that falls or is thrown upon them to soak into them or between the blocks, under the alternations of temperature, and dryness and humidity of our climate, are, from the very nature of things so disposed, a source of putridity and foul air. Asphalt pavements close up completely this source of filth and its consequences.

Besides, they are noiseless and smooth, and those in health, as well as those who are sick, derive benefit in riding over them.

It should be borne in mind, however, that while it is easy to make asphalt pavements which will look well for a short while, it is not so easy to secure permanent durability. Asphalt pavements, *well made*, are the best of all pavements. *Ill* made, there are none worse.

State Medicine and Public Hygiene.—Dr. J. L. Cabell, Chairman of Section on State Medicine and Public Hygiene of the American Medical Association, has addressed a circular to all the members of the said Section, requesting continued attention to the subjects of *Defective Drainage* and *Water Supply*, as topics of primary importance; and "with the view of indicating the line of investigation heretofore pursued, producing uniformity of action, appends the questions, in a few instances slightly modified, which were originally proposed by Dr. Bell and Dr. Kedzie," as follows:

Defective Drainage.—1. To what extent are the diseases of your county due to insufficient drainage? In answering this question state any facts in your knowledge which serve to establish a connection between defective drainage and the generation or development of other diseases than the common malarial fevers, such as consumption, catarrhal affections, pneumonia, diphtheria, diarrhœal diseases, typhoid fever, etc., etc. 2. How many acres of marsh lands have you in your county? 3. Have you intermittent diseases not attributable to marshy deposits, but to soil saturation. 4. Are there in your county places where intermittent fever has disappeared as a result of systematic drainage of the surface saturation? 5. What system of drainage is necessary to render your county free from malarious diseases?

Water Supply as Related to Public Health.—1. Water supply as affected by geological formation, including the rock formations, influence of different kinds of soils, depth of water supply, etc. 2. Influence of rain-fall and of drought upon the purity of the water. 3. Contamination of water by decomposing vegetable matter (influence of swamps, etc.), by decomposing animal matter (fecal matter, influence of graveyards, etc.), and sewage contamination of streams. 4. Spread of contagious diseases by water contamination. 5. Water supply of cities.

In presenting these topics it was pertinently represented that "by thus calling the attention of persons in all parts of our country to causes of danger which are at work in their own vicinity, much good may be accomplished by removing the causes of a large amount of sickness."

It is requested that contributions on either or both of the above-named subjects be sent on or before the 1st of May to

J. L. CABELL, M.D., University of Virginia.

California State Board of Health does not show that degree of progress which its age and field of labor reasonably suggest. Its last report,* now before us, is diminutive in both size and quality as compared with previous reports; due, we are informed, to the ignorance and meanness of the legislature in placing a limit on the publication of information necessary to the health of the people. The joint report submitted in behalf of the Board by Dr. F. W. Hatch, Permanent Secretary, consists of six pages, and comprehends a rehearsal of the duties, suggestive examples of more effective work in other places, the necessity of a registry, and the establishment of local Boards of Health throughout the State, and a statement of the expenses—within the appropriation—four thousand dollars per annum. This is followed by the report of the Permanent Secretary to the Board, giving in detail an account of the work accomplished for the period, and the present aspect of sanitary affairs. It opens with a regretful loss of reports and papers, emanating from correspondents of the Board, incidental to the death of his predecessor in office, Dr. T. M. Logan. In consequence of this loss the present report is limited to the calendar year of 1876 alone.

The first duty of the present Secretary was the distribution of pure bovine lymph throughout the State for the prevention of small-pox, which broke out in San Francisco in May, 1876. To his prompt action in this regard is attributed the limitation and final suppression of the epidemic. The importance of timely action by the Board in regard to the supply of pure water for San Diego; the relation of diphtheria to sewer gas, and measures for its suppression, and "How to Keep Sewer Gas out of Houses," are briefly and intelligently discussed.

Mortality statistics are summarized for thirty-three cities and towns, comprehending a population of 459,650, for periods of time ranging from five to twelve months, and with ratios of annual mortality per 1,000 from 4 to 24.8: average for the whole, 13.8; 43 per cent. of the entire mortality was from zymotic diseases. Of the whole number of deaths, 8,032—2,552, or 31 per cent., were of children under five years of age, and of these children, 41 per cent. were killed by zymotic diseases.

* Fourth Biennial Report of the State Board of Health of California for the years 1876 and 1877, pp. 92. Sacramento: State Office.

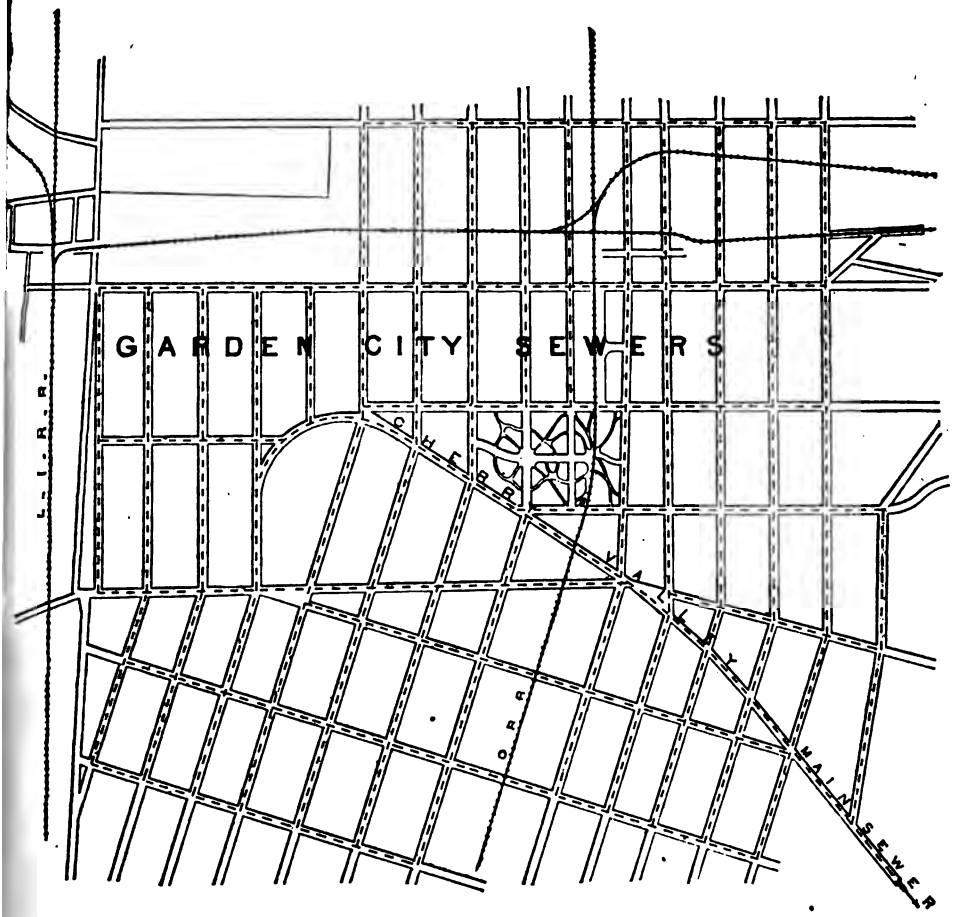
From consumption there were 962 deaths, 12 per cent. of the entire mortality, one death from disease in every four hundred and twenty-four of the population represented. In the cities, the mortality from consumption was 12 per cent. of the total.

An interesting table of the mortality from consumption is given, showing its relation to nativities. And it is not a little remarkable that the Chinese, who for the most part live in squalor, show that "comparatively few of them die of this disease."

Besides his general report, the Secretary makes an additional report on the *Relations of Climate in California to Consumption*, clearly comprehending a variety of climates in the different localities of that State, "as distinct at certain seasons as those of New York and Florida," exhibiting the importance, above all things else, *of such situations as will admit of out-door* exercise.

Sickness reports are given from seven localities: Pneumonia, 119—died, 7; bronchitis, 72—died, 3; other respiratory diseases, 4—died, 1. Further reports in this direction are urged, and a postal-card-form distributed in furtherance of the object.

An appendix of thirty pages, containing: Suggestions in regard to State Hospitals for Consumptives, by Henry Gibbons, M.D.; State Prison at San Quentin, by A. B. Stout, M.D.; Adulteration of Food, Drinks, and Drugs, by Joseph F. Montgomery, M.D.; Report on Prison Discipline, by A. B. Stout, M.D.; On the Danger of Eating the Skin and Seeds of Grapes, by H. Gibbons, Sen., M.D.; Sewerage for Stockton, by F. Water Todd, M.D.; Sanitary Condition of the City Front of San Francisco, by A. B. Stout, M.D.; Temperature Tables, and a suggested amendment to the Code requiring the establishment of local Boards of Health and regular reports, conclude the report. These concluding suggestions and brief reports are all more or less valuable, indicating a fruitful field of labor, and the want of more systematic and thorough work. The Permanent Secretary has evidently devoted himself to the duties of his office, and has accomplished much; for the rest, wholly voluntary labor, it is certainly better than the State has any right to expect without appropriation to pay for it; and if the State would show any proper concern for the health of her people, any desire to promote and sustain a reputation for healthfulness, she will make haste to meet the suggestions of this report by making the needful appropriations.



Garden City Sewage Works.—The following plan of the Sewer Works at Garden City, now in process of construction, with which we have been favored by Mr. W. R. Hinsdale, the Manager, is in accordance with the best sanitary results of modern experience, namely: that the disposal of surface water and soil drainage, and sewage, should be by wholly distinct systems; that neither in the smaller inland towns nor in seaboard cities can these two objects be safely and economically combined.

The object sought in this case is to dispose of the sewage without detriment to the healthfulness of the neighborhood, and to do this it is requisite that the sewage be kept under control, without exposure over an extended surface, and rendered not only harmless, but to some extent of value, by converting it immediately to useful purposes.

The works are situated at a suitable distance from the inhabited portions of the place, at the extremity of the main sewer.

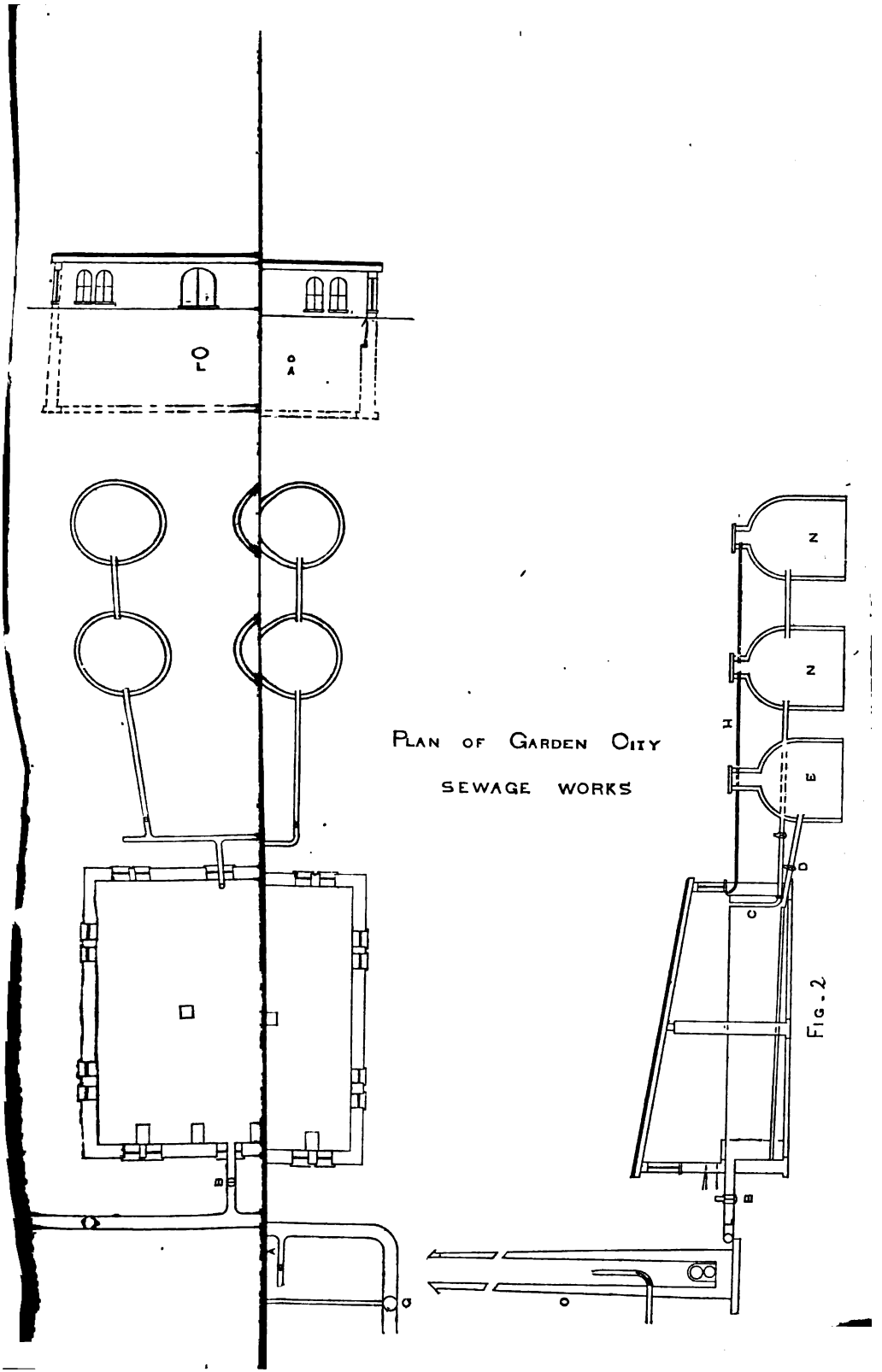
By reference to the plan, Fig. 1, it will be seen that the main sewer "L," near the works is intersected by the pipe "A," through which is conveyed into the sewage, as it passes to the precipitating tanks, an inexpensive mixture to aid in clarifying and throwing down the flocculent particles distributed throughout the sewage.

The first tank being filled, the gate "B" in the outlet pipe is closed and the next gate opened, permitting the sewage to flow into the next tank. Meanwhile, the sewage in the first tank being at rest, the heaviest particles are deposited in sediment, or, as it is technically termed, "*sludge*," at the bottom of the tank. The upright pipe "C," Fig. 2, is then inclined to one side by means of a swivel joint, at the angle where it enters the wall, and through a floating filter (not shown) draws the clarified liquid from the surface of the tank and conducts it to the absorbent cesspools "N," constructed in the adjacent filter bed, without disturbing the sedimentary deposit. After which the gate "D" in the lower pipe is opened and the sediment discharged into the cemented sludge pit "E," from which it is forced into air-tight receptacles mounted on wheels, and removed to be used as a fertilizer.

So far the process is not new, but has been similarly used in various places in Europe, and to the extent of simply clarifying the liquid and converting the residuum into a fertilizer for land without very serious difficulty.

The plan of forced ventilation of sewers seems never to have been practised in conjunction with the water-carriage system. Captain Liernur's method is the only one approaching the idea, and that is so cumbersome and expensive, and withal so widely different from this, being intermittent in fact—occurring only once a day—in prohibiting the free use of water, and in the treatment of the sewage, as to render comparison unnecessary.

The ventilation of the works and the system of sewers will be readily understood by reference to the plan, Figs. 1 and 2. The induction pipe "F" of the Root blower "K"(used also as an exhauster), connects with a manhole "G" on the main sewer near the works. The air from the tank being *trapped*, or hindered by the gate from passing into the sewer, it follows as a necessity that the air required to supply the blower is drawn from the system of sewers, thus forming a constant indraught, and not only relieving the housetraps from any possibility of back pressure, but continually flushing the sewers with pure air drawn through the perforated manhole covers —thus aerating the whole system of pipes, and thereby preventing



PLAN OF GARDEN CITY

SEWAGE WORKS

FIG. 2

the causes of disease commonly believed to originate in unventilated sewers from stagnation and putrefaction.

The method of forcing the air drawn from the sewers into the ventilating shaft "O," as shown in Fig. 3, is the same substantially as is successfully used for the ventilation of mines, and by causing a strong upward current in the shaft, aided by the rarified air, will displace from the surface of the tanks many times the volume of air forced through the pipes of the blower. This great volume of pure air received through openings in the wall of the tanks, and discharged at the top of the ventilating shaft, will effectually remove and render innocuous all offensive gases arising from the sewage in the process of clarification.

Note to Dr. Van Bibber's Paper on Ventilation.—The following *note* was received from Dr. Van Bibber after the form containing the conclusion of his paper was printed.—Editor.

Since writing the foregoing paper, Mr. Robert Briggs and Surgeon J. S. Billings, U.S.A., in a recent publication, have taken a different view upon the carbonic acid question from that given in my paper.

Mr. Briggs, in a private letter to me, says: "The assumption that carbonic-acid gas will separate from air is quite erroneous. No fact in chemistry is more determined than that gases will not separate in the least from difference of specific, or by heating and cooling of mixed gases," etc.

Surgeon J. S. Billings, U.S.A., in a recent report "On Heating and Ventilation," etc., says: "Carbonic acid is equally diffused throughout the room; it does not collect near the floor," etc. He refers to a study of the law of the diffusion of gases: J. L. Lassaigne's work. Paris: 1846. And to —— Thompson, *Indian Medical Gazette*, 1869.

I was aware of these views concerning carbonic acid, and they would have been alluded to in my paper but for these reasons: First, The question is as yet unsettled; second, in a popular paper, the necessity for a ventilating current is best shown by admitting the well-known fact of the weight of carbonic acid mixed with organic matters; and third, other researches are now going on which may hereafter tend to modify the very positive assertions now made upon the subject of carbonic acid.

W. C. Van Bibber, M.D.

Baltimore, March 9th, 1878.

Death-rates per 1,000 inhabitants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Fox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Typ. Fevs	Malarial Fevers.	Diarrhœal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500	2048	14.32	901	376		98	96	34	78	19	4	23	48	27	54
Philadelphia, 850,900—6 weeks ending Mar. 9	1850	18.72	660	313		51	77	1	61	8	47	3	18	7	118
Brooklyn, 528,000—4 weeks ending Feb. 23	742	17.54	344	133		40	45	2	25	5	2		15	17	62
St. Louis, 500,000—5 weeks ending March 2	466	12.10	176	82		10	1	2	6	4	5	6	10	7	48
Chicago, 460,000—5 weeks ending March 2	605	12.61	315	67	2	22	14	11	29	19	12	4	2	15	73
Baltimore, 350,000—5 weeks ending March 2	662	12.41	249	149		41	9		14	5	13	1	5	4	61
Boston, 363,000—5 weeks ending March 2	650	18.58	71	16		5			1		2		4	1	
Cincinnati, 280,000—2 weeks ending March 2	180	24.65	71	33		2	1	6	2	2	6		3	1	13
San Francisco, 300,000—month of Jan.	457	12.93	171	62	1	37	3	13	8	6	15			2	30
New Orleans, 210,000—3 weeks ending Feb. 17	308	8.48	87	40	16	2			4		4	5	12		
Washington, 160,000—month of Jan.	343	10.35	138	73			19	2	6	1			6	2	26
Pittsburgh, 145,000—4 weeks ending March 2	234	20.69	120	25	27	29	9		1	7	9		1	3	13
Newark, 126,000—month of Dec.	318	20.14	135	41		13	36		13		8		3	1	19
Providence, 108,000—month of Feb.	174	20.88	89	21		19	2	22	5	4			1	1	13
Milwaukee, 123,000—															
Rochester, 70,000—															
Richmond, 77,000—5 weeks ending March 2	130	16.18	45	20		5	6		2	2	1		1		18
New Haven, 60,000—month of Feb.	92	11.78	28	12		3	6		2		2			5	
Charleston, 57,000—5 weeks ending March 2	121	21.9	40												
Toledo, 50,000—															
Mobile, 40,000—month of Jan.	66	14.75	18	11									1	2	16
Dayton, 36,000—4 weeks ending March 7	26	9.13		7											
Nashville, 27,000—															
Wheeling, 28,000—2 months ending Feb. 28	68	28.8	28	11	1				1	2	3				9
Buffalo, 170,000—															
Knoxville, 13,000—															
Paterson, 40,000—month of Feb.	54	11.4	33	10		4	2		2						
Petersburg, 20,000—															
Selma, 8,000—															
Elmira, 20,090—month of Feb.	18	10.77	10	2		4			1						
Yonkers, 18,000—month of Feb.	21	13.76	4	5		1	1		1						1
Memphis, 45,000—															
Detroit, 115,000—															
Syracuse, 60,000—															
Reading, 40,000—month of Feb.	56	10.73	29	6		7			2						9
Sacramento, 21,000—															
Minneapolis, 44,000—															
Bowling Green, 6,000—															

Foreign.—United Kingdom of Great Britain. During two weeks ending Jan. 19th, 12,197 births and 8,331 deaths were registered in London and twenty-two other large towns, and the natural increase of the population was 3,866. The annual ratio of mortality from all causes was, per 1,000, in London, 27;

Correction.—By over confidence in new clerical work and new printer, the preceding page of errors was printed before examination by the EDITOR.

Death-rates per 1,000 inhabitants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Pox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Type Fevs	Malarial Fevers.	Diarrheal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500—4 weeks ending Feb. 23	2048	24.61	901	376		93	96	34	78	19	4	23	48	27	54
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St. Louis, 500,000—5 weeks ending March 2	466	9.71	176	82		10	1	2	6	4	5	6	10	7	48
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Baltimore, 350,000—5 weeks ending March 2	662	19.24	249	149		41	9		14	5	13	1	5	4	61
Boston, 363,000—5 weeks ending March 2	650	18.67	71	16		5			1		2		4	1	
Cincinnati, 280,000—2 weeks ending March 2	180	17.27	71	33		2	1	6	2	2	6		3	1	13
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Pittsburgh, 145,000—4 weeks ending March 2	284	25.08	120	25	27	29	9		1	7	9		1	3	13
Newark, 126,000—month of Dec	318	29.71	135	41		13	36		13		8		3	1	19
Providence, 108,000—month of Feb	174	23.02	89	21		19	2	22	5	4			1	1	13
Milwaukee, 123,000—															
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Richmond, 77,000—5 weeks ending March 2	180	17.47	45	20		5	6		2	2	1		1		18
New Haven, 60,000—month of Feb	92	19.98	28	12		3	6		2		2			5	
Charleston, 57,000—5 weeks ending March 2	121	23.1	40												
Toledo, 50,000—															
Mobile, 40,000—month of Jan	66	19.42	18	11									1	2	16
Dayton, 36,000—4 weeks ending March 7	26	9.41		7											
Nashville, 27,000—															
Wheeling, 28,000—2 months ending Feb. 28	68	15.02	28	11	1				1	2	3				9
Buffalo, 170,000—															
Knoxville, 13,000—															
Paterson, 40,000—month of Feb	54	17.59	33	10		4	2		2						
Petersburg, 20,000—															
Selma, 8,000—															
Elmira, 20,090—month of Feb	18	11.68	10	2		4			1						
Yonkers, 18,000—month of Feb	21	15.2	4	5		1	1		1						1
Memphis, 45,000—															
Detroit, 115,000—															
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Foreign.—United Kingdom of Great Britain. During two weeks ending Jan. 19th, 12,197 births and 8,331 deaths were registered in London and twenty-two other large towns, and the natural increase of the population was 3,866. The annual ratio of mortality from all causes was, per 1,000, in London, 27;

Edinburgh, 28; Glasgow, 26.50; Dublin, 30; Portsmouth, 19; Norwich, 19; Wolverhampton, 24.50; Sunderland, 24; Sheffield, 20; Birmingham, 27.50; Bristol, 26; Liverpool, 30.50; Salford, 24.50; Oldham, 27; Bradford, 21; Leeds, 22; Hull, 21.50; Newcastle-upon-Tyne, 23; Leicester, 17.50; Manchester, 27; Nottingham, 20. Other foreign cities at most recent dates (week ending), per 1,000—Paris, Jan. 17, 26.4; Rome, Nov. 24, 28.7; Vienna, Jan. 12, 31.8; Brussels, Jan. 12, 31.8; Berlin, Dec. 29, 28.2; Hamburg, Jan. 5, 29.7; Calcutta, Dec. 15, 54.3; Bombay, Dec. 18, 23.5; Madras, Nov. 30, 97.2; Amsterdam, Jan. 5, 34.4; Rotterdam, Jan. 5, 32; The Hague, Jan. 5, 37.1; Christiana, Jan. 12, 20; Breslau, Jan. 12, 25.1; Buda Pesth, Jan. 5, 40.5; Turin, Dec. 29, 37.1; Alexandria, Jan. 10, 48; Copenhagen, Jan. 8, 25.4; Munich, Jan. 12, 32; Naples, Dec. 16, 30.7.

Louisiana State Board of Health: Annual report for 1877 begins with the special report of the President of the Board to the Governor, summarizing the unsanitary conditions and sanitary operations in New Orleans; the prevalence of small-pox and the urgent necessity of vaccination and revaccination for its prevention; the repeal of the monopoly of the "Sanitary Excavating Company," and the formation of eight other companies, by which the sanitation of the city has been greatly promoted; adoption of the contract plan of cleaning streets and gutters; organization of a new waterworks company, and the importance of drainage for the prevention of malarial diseases and consumption; the contagiousness of yellow fever "by the multiplication of its germs, the infecting distance of which is at first short—that it travels upon surfaces, and like the orange, the banana, and the sugar-cane, is an exotic, its cradle being the Antilles, and therefore have earnestly endeavored to prevent its introduction into New Orleans by a most rigid system of quarantine and the use of disinfectants"; the advantages of intrusting the Board of Health with the registry of vital statistics; the importance of organizing local boards of health in all the parishes of the State; inspection of stock and slaughter houses, and needed amendments to the law in order to render it free from the embarrassments of the City Council and to give it greater efficiency in all its details.

The hypothesis in regard to the progress of yellow fever, which the president states the Board accepts, is, to say the least, remarkable: "Contagious in its nature by the multiplication of its germs," and yet "travels upon surfaces." It is, perhaps, the only way to reconcile the germ theory with the carbolic-acid *cordon*, which is said to have been so effectual in New Orleans *after the cleansing*, but of no effect at all in places not cleansed.

Following the president's summary, the several sanitary inspectors—seven in all—submit reports, covering as many districts, into which the sanitary work of the city is divided, each one giving in detail the condition of his district, the amount and nature of the work performed, special reports on the prevalence of diseases, and the efforts made for their prevention. Prof. Jos. Jones (member of the Board) submits a special report on cumpulsory vaccination, which he urges as the means above all others best calculated to eradicate small-pox, by the thorough vaccination of every man, woman, and child.

The Inspector of Coal-oils reports "accidents involving destruction of life and property . . . with a frequency scarcely, if at all, diminished since the

law went into effect," for establishing a standard of safety. A more stringent law is advised.

The records of births, marriages, and deaths in New Orleans for the year were: 2,765, 1,270, and 6,708. Estimated population: Whites, 145,721; colored, 57,647. Mortality: Whites, 3,976; colored, 2,732. Ratios per 1,000: Whites, 27.28; colored, 47.13; aggregate, 32.97. Still-births: Whites, 279; colored, 172.

St. Louis is certainly the healthiest city of its size in the world, if we accept her Board of Health reports as correct. According to the one now before us—for the interval between the 31st of December, 1875, and January 1st, 1877—the number of deaths reported was 6,019. Estimating the population at 500,000: ratio per 1,000, 12.04. Notwithstanding, 5,594, or more than five-sixths of the whole, were of zymotic diseases; consumption, 711, or one in 8.46 of all the deaths; under five years of age, 2,840—considerably more than one-third of the total number. These ratios to the total number, from all causes, are even more surprising than the aggregate whole. But the ex-Health Officer, W. L. Barrett, M.D., remarks: "As to the accuracy of the mortuary record there can be no doubt, and every method of scrutiny seems to confirm the fairness of the estimate of the population above given."

Of births and marriages there are no reports. Of still and premature births, 525. "The year was signalized by the prosecution and completion of many sanitary enterprises of great moment. Vast districts were drained, old standing nuisances were abated, tenement houses were . . . renovated and improved, offensive trades regulated, milk supply investigated," etc., and the usefulness of the Health Department materially augmented.

Utica.—Annual report of Board of Health for 1877. Population, 35,000; births, 865; marriages, 127; deaths, 552, of which 51 died in the State Lunatic Asylum: exclusive of these, ratio per 1,000, 14.31. Still-births, 39; deaths under five years of age, 190. Chief causes: Consumption, 67; diphtheria, 42; diarrhœal diseases, 40; "old age," 17; convulsions, 17; typhoid fever, 15; marasmus, 15. The death-rate is the smallest since 1872, that year being the first of systematic registration.

The report also comprehends the health ordinances which have been adopted, general remarks on the value of sanitary knowledge, the importance of safe sewerage, effectual drainage, good water supply, milk supply, etc., etc., and the usual conditions of preventable diseases.

Knoxville, Tenn.—Annual report of City Physician, 1877. Total mortality, 185: Whites, 86; colored, 99. Population, 13,250: Whites, 8,250; colored, 5,000. Ratios per 1,000: Whites, 10.42; colored, 19.80. Under five years of age, 71. Chief causes: Consumption, 39; zymotic diseases, 34. Births, 377: 145 white, and 122 colored—1 for every 35.14 inhabitants. Still-births, 42.

Rhode Island.—Twenty-fourth Registration Report, 1876, by Dr. E. M. Snow, shows: Births, 6,329; marriages, 2,253; deaths, 4,116; population, 258,239. Ratios: Births, 1 in every 40.8, or 24.51 per 1,000; marriages, 1 in every 57.3, or 17.45 per 1,000; deaths, 1 in every 62.7, or 15.9 per 1,000.

Of the total number of children born in 1876, 46.43 in each 100 had American fathers, and 53.57 in each 100 had foreign fathers.

"In whatever light we consider the figures, we find that the proportion of children of American parentage is less than the proportion of the living population, and the proportion of children

of foreign parentage is greater than that of the living population of the same parentage."

Of marriages: "All by clergymen *living out of the State*, and all between a white person and a negro, Indian or mulatto, . . . idiots, or lunatics, shall be absolutely null and void."

Of the deaths: Average age of decedents—Males, 31.47 years; females, 33 .21. Chief causes: Consumption, 655 —more than three times as many as from any other cause; other lung diseases, 339; cholera infantum, 250; "old age," 241; diseases of heart, 166; diphtheria, 159; fevers, typhoid, etc., 126; cancer, 106; croup, 102; convulsions, 89; scarlatina, 90.

The report almost wholly consists of well-arranged tables, and is evidently the issue of much profound study and painstaking on the part of its industrious author.

State Medical Society Transactions.*—Of these, in our May number of last year, we took occasion to express "regret that so many good, practical papers here lie buried—published in a majority of cases in editions of a few hundred only, for the members of the societies before which they were read —instead of having been contributed to the medical journals, and circulated for the benefit of the profession at large."

The transactions of the Medical Society of Virginia are a notable exception; these are published in the Virginia *Medical Monthly*, separately paged, and "when a sufficient number of annual parts will have been published to make a book of convenient size—say 500 or 600 pages—then these successive annual parts will be properly indexed," and the volume completed for members. The papers most worthy of note in the part before us, from our point of view, are: The address by the president, J. L. Cabell, M.D., and the report on Advances in Hygiene and Public Health, by L. S. Joynes, M.D., Sec. of the State Board of Health. Dr. Cabell, besides admirably summing up the present status of the medical profession in relation to State and statutory law, cites numerous pointed examples illustrating the value and necessity of State and local sanitary organizations, and urges their consideration on the profession and the Legislature, as among the most essential measures for the substantial prosperity of the people.

Dr. Joynes shows the value of State medicine and sanitary regulations by a careful estimate of the amount and cost of preventable sickness and mortality, the pecuniary value of health, and the importance of sanitary economy to all communities. In illustration he cites the figures of Dr. Rawson, given before the International Medical Congress at Philadelphia in 1876, in regard to New York:

"In the United States an adult emigrant is estimated as representing a capital of $1,000 incorporated in the national wealth. Now, 8,580 adults died, in 1875, in the city of New York, figuring, consequently, for an aggregate of $8,580,000. With these numbers, every figure of which I have carefully calculated,

* Transactions of Eighth Annual Session of the Medical Society of Virginia, 1877. Volume II, Part II.
(2) Transactions of the Medical Society of Pennsylvania, Twenty-eighth Annual Session, Volume XI, Part II, 1877.
(3) Transactions of Wisconsin State Medical Society, 1877.
(4) Transactions of Kansas State Medical Society, 1877.
(5) Transactions of Medical and Chirurgical Faculty of Maryland, 1877.
(6) Transactions of Medical Society of New Jersey, 1877.
(7) Transactions of Medical Society, West Virginia, 1877.
(8) Transactions of Medical Association of Georgia, 1877.
(9) Transactions of Medical Association of Alabama—A State Board of Health.
(10) Transactions of Ohio Medical Society, 1877.
(11) Transactions of Medical Association of Missouri, 1877.

. . . the losses in the account of public health for 1875 may be posted as follows:

Work lost, - - - -	$8,298,566
Loss, expenses incurred by sickness, - -	22,417,590
Loss, adult lives, - -	8,580,000
	$39,296,156

"These losses cannot be avoided, but they may be considerably diminished. If the mortality had been 21 per 1,000, instead of 29 per 1,000, each of the items in the account would have been reduced in the same proportion; the aggregate would only have been $28,452,216, and there would have been an economy of $10,838,840."

Similar citations are made from the writings of Pettenkofer, Edwin Chadwick, John Simon, and other authorities, all going to show the great importance of practical sanitation to all communities. Epidemic Zymotic Diseases of Animals, by John R. Page, M.D., shows the relation of filth as a cause no less common in the epidemics of animals than in the diseases to which mankind is subject, and consequently alike amenable to preventive measures and "*stamping out.*" Too far the author goes, however, with the common wont of modern theorizers in regard to the germ origin of such diseases: "That each is represented by a poison (germ) that seems to have a distinct origin, development, course, and mode of propagation," . . .—a theory which is, to say the least, inconsistent with the ordinary progress of such diseases, and the most effectual means of arresting them. Advances in Chemistry, by M. G. Ellzy, M.D.; Advances in Obstetrics and Diseases of Women and Children, by Robert J. Preston, M.D.; and Advances in the Practice of Medicine, by John S. Apperson, M.D., are all excellent summaries of their respective departments. In addition to which there are special reports and papers on: Poisoning by Custards and Ice Cream, by J. S. Wellford, M.D.; Heart Clots, by Martin L. James, M.D.; Bony Union of Fracture of the Neck of the Femur, by William Selden, M.D.; Iodoform as a Local Remedy, by J. E. Chancellor, M.D.; a general discussion on Instrumental Labor; report of the Necrological Committee, and the minutes of the proceedings.

(2) *The Pennsylvania Transactions* form a substantial volume of over four hundred pages of systematic work, representing and summarizing: Obstetrics, by S. B. Kieffer, M.D.; Surgery, by H. L. Hodge, M.D.; Mental Disorders, by John Curwin, M.D.; and Hygiene, by Benjamin Lee, M.D. Reports from eighteen county societies, special reports and papers on some forms of Inflammatory Diseases of the Eye, Diagnosis of the Psoas Ascess, Fracture of the Ulna, Urethral Fistula, the Metric System, Modification of Syme's Amputation at the Ankle-joint, and An Act to Create a State Board of Health. Dr. Lee's address on Hygiene considers the "End and Scope of a State Board of Health," as illustrated by the progress of legislation on sanitary subjects in England, and in Massachusetts. The act for the creation of a State Board of Health in Pennsylvania comprehends the main features of the form recommended by the American Public Health Association (THE SANITARIAN, vol. 2, p. 535).

(3) *Wisconsin Society Transactions* comprehend: Address of the president, J. K. Bartlett, M.D.; a lecture on the Brain in Health and Disease, by Walter Kempster, M.D.; and fifteen special reports and papers on practical medicine and surgery. Dr. Bartlett pays a just tribute to preventive medicine, congratulates the Society and State on the

efficiency and energy of the new State Board of Health, and urges the profession to a hearty and untiring effort to enlighten the public on preventive medicine as the best service they can render their constituency and State.

(4) *The Kansas Society* reports ten short papers on subjects of practical importance, introduced by a brief but cogent address by the president, H. S. Roberts, M.D., who urges more—and concerted—action on the part of the members of the Society in the interest of effectual measures for the prevention of disease, and influence with the Legislature.

(5) *Transactions of Medical and Chirurgical Faculty of Maryland.*—The opening address by Christopher Johnson, M.D., president, dwells, especially on the confidential relations of physician and patient, and the importance of expert and other medical testimony. The annual oration, by S. Weir Mitchell, M.D., contains valuable suggestions in therapeutics—not by any means confined to dosing, but more especially illustrating the benefit of rest and dietetics, and the judicious use of extraordinary means in extreme cases. The reports on Surgery, Practice of Medicine, Obstetrics and Gynecology, Materia Medica, Anatomy and Physiology, and Psychology and Physiology, in the order named, by Drs. L. McL. Tiffany, Jno. S. Lynch, John Morris, W. C. Van Bibber, John N. Monmonier, and Abram B. Arnold—all show the benefit of a well organized society. These reports are, without exception, examples of progressive labor, by men capable of distinguishing and appreciating true advancement, and full of useful practical suggestions.

The Treatment of Strictures of the Nasal Duct, by Samuel Theobald, M. D.; Diseases of the Bladder and Rectum, by B. B. Browne, M.D., and Incontinence of Urine, by Randolph Winslow, M.D., are also excellent practical papers on difficult subjects.

The Moliere Thermo-Electric Baths, advertised in this number, are well worthy the attention of all who would enjoy them for either luxury or health. Whatever may be said of baths in general—and it is hardly possible to over-estimate their benefits to human health—may be said of these with special emphasis. In situation, appointments, and attendance, they are in every way qualified to merit the patronage which they so richly deserve; and we take pleasure in commending them to the public.

Vick's Illustrated Monthly Magazine is necessary to all persons in the United States who would know all about the most suitable flowers and ornamental plants for every month in the year for both garden and parlor; and herein may also be found instructions for laying out gardens and borders, the cultivation of garden fruits and vegetables, and how to attain the highest degree of perfection. $1.25 a year. James Vick, Rochester, N. Y.

The American Garden.—A quarterly illustrated journal devoted to Garden Art, claims to be the cheapest magazine in the world. However that may be, in regard to the price—**only 25 cents a year**!—it is filled with information dear to all true lovers of flowers; tells how to rear them in health and beauty, and gives numerous illustrations as standards of comparison. Beach, Son & Co., No. 7 Barclay street, New York.

Scales—counter, platform, wagon, and truck—as advertised by the Marvin Safe and Scale Co., may be relied upon as the very best in the market, and at prices in keeping with the times.

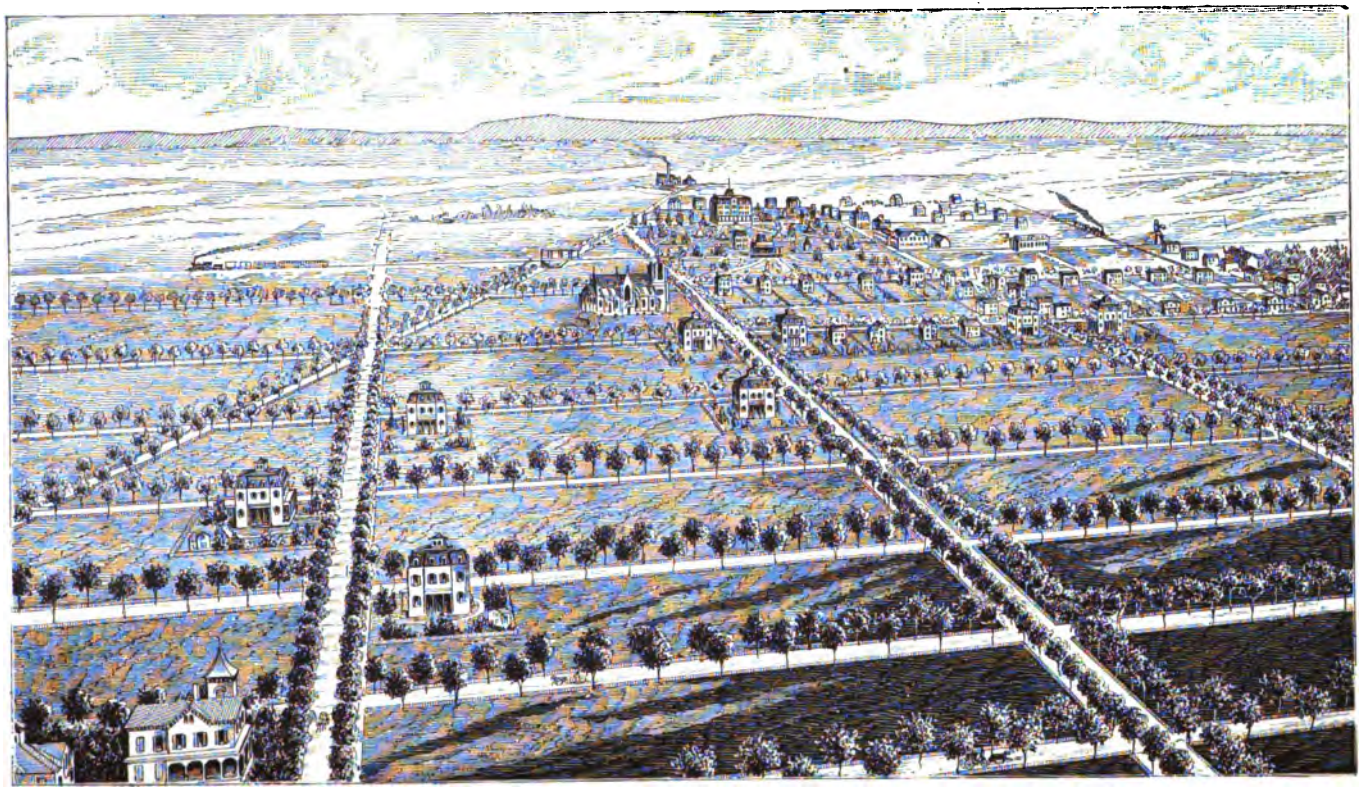
International Review—March-April—gives evidence of continued

growth in the command it holds of the highest standard of national literature. This number contains: Reminiscences, Alexander H. Stevens *vs.* those of Gen. Richard Taylor. By Hon. ALEXANDER H. STEVENS, LATE VICE-PRESIDENT OF THE SOUTHERN CONFEDERACY; Elements of National Wealth, DAVID A. WELLS; The Mexico of the Mexicans, WILL T. PRITCHARD, F.R.S., etc.; Noted Women of Bologna, MME. VILLARI, OF ITALY; Method of Electing the President, JUDGE T. M. COOLEY AND ABRAM S. HEWITT; Modern Love, DR. SAMUEL OSGOOD; Relation of Morality to Religion, DR. A. P. PEABODY; Silver in Art, EDWIN C. TAYLOR; Imperial Federalism in Germany, BARON VON HOLTZENDORFF; New York and Its History, GEN. J. WATTS DE PEYSTER; Contemporary Literature. $5.00 a year. A. S. Barnes & Co., New York.

Books Received.—Through the kindness of Dr. de Pietra Santa, editor-in-chief of the *Journal d'Hygiène*, we have received the first series of the publications to be issued by the *Société Française d'Hygiène* for the promotion of public health. We give the titles as follows, intending to notice the Society and its publications more in detail hereafter: *Société Française d'Hygiène, sa Raison d'être*, son But, son Avenir. Conférence faite le 25 Mai, 1877, dans la salle du Boulevard des Capucines, par M. le Dr. de Pietra Santa, redacteur en chef du *Journal d'Hygiène*. *La Réforme du Casernement, Réduction de la Mortalité dans l'Armée Française. Les Bains-Douches.* Conférence faite le 12 Octobre, 1877, par M. C. Follet. Paris V. A. Delahaye et Ce., Libraires-Editeurs; Place de l'Ecole-de-Médecine, 1877. *Rapport de Lois et des Mœurs avec la Population.* Conférence faite le 12 Octobre, 1877. Par Le Dr. S. E. Maurin, Président-fondateur de la Soci t protectrice de l'enfance de Marseille, Membre du Conseil d'Administration de la Société Française d'Hygiène, Directeur scientifique du Journal des Jeunes Mères. Paris, Delahaye. *Participation de la Société Française d'Hygiène à l'Exposition et Congrès de Leamington.* Organisation des Secours Publics à Paris, par Placide Conly. Paris, Delahaye. 1877.

Dodeligheden Blandt De Nyfodte af H. C. Sager. Rudkjobing Trykt hos F. J. Hoeg, 1877. Assamissement de la Seine. Epuration et Utilisation des Eaux d'Égout. Rapport de la Commission d'Enzuête de la Seine sur l'avant—projet d'un Canal d'irrigation de Clichy, à la Forrêt de Saint Germain. Paris: Guathier-Villars-Quai des Augustins, 55. Do Phosphureto de Zinco, sua Acçao Physiologica e Therapeutica, pelo Dr. D. A. Martins Costa, membro titular da Imperial Academia de Medicina do Rio de Janeiro, medico da Casa de Saude de N. S. d' Ajuda redactor do *Progresso Medico*, etc. Rio de Janeiro, Typographia-Academica—rua Sete de Setembro, n. 78, 1877. Question des Inhumations Précipitées, par J. A. Pichot, et P. P. Malapert Professeur de Chimie à l'École Préparatoire de Médecine et de Pharmacie de Poitiers. Poitiers, Typographie de Henri Oudin. Frastornos del Aparato de las Vision en las Fiebres Paludeas y accidentes a que puede dar lugar su ineludible tratamiento por el sulfato de quinia, por el Dr. D. Juan Santos Fernandez, director de una Clinica de enfermedades de los ojos, miembro numerario de la Real Academia de Crencias de la Habana, de la Sociedad Antropologica de la Isla de Cuba, etc. Habana: Imprenta Militar de la Viuda de Soler y compañia, Calle de Ricla Num. 40. 1877.

Leonard's Reference and Post Book; Richardson's Address on the Future of Sanitary Science; Billings' Report on Heating and Ventilation—Johns Hopkins Hospital; Brooklyn Board of Health Report, 1875–76.



GARDEN CITY.

THE SANITARIAN.

A MONTHLY MAGAZINE.

Vol. VI. MAY, 1878. No. 62.

THE CATHEDRAL OF THE INCARNATION.

The Stewart Memorial at Garden City, the Cathedral of the Episcopal Diocese of Long Island, though not pretentious in the matter of its dimensions, yet in elegance and gracefulness of design, in beauty of proportion and ornamentation, is unequalled by any ecclesiastical structure in this country, and will not suffer by comparison with the finest architectural creations of Europe.

It is the beginning in America of a system of Church perpetuity that has become marked in the old world, and which has made famous many European cities. In the purchase of Hempstead Plains Mr. Stewart saw the opportunity of founding a place of residence remarkable for its healthful surroundings, which should embrace at the outset a plan sufficiently elaborate to comprehend every advantage which modern progress could suggest.

With abundant means at the command of those who have been intrusted with its development, the original design has been kept constantly in view, and upon a scale which, while it would be certain to insure for its future all that had been from the first intended, would be an enduring memorial of its founder.

As a gift to the Episcopal Diocese of Long Island, the Cathedral was projected under the sanction of the Bishop and clergy; and while, with its school systems as adjuncts, it establishes a centre in a desirable locality, not far distant from the great metropolis, it constitutes a special characteristic of the new city, and a prominent feature of the Protestant Episcopal Church of Long Island.

The famous cathedrals of Europe are remarkable for their size, which is sometimes regarded as in some measure compensating for severe faults of architectural design; and many of them have been so expensive in details that their completion has been tedious, and not always in accordance with the grand ideas upon which they were begun.

After the acceptance of the plans, the contracts were at once made for the material, and the corner-stone was laid with appropriate ceremonies. From that time until the present the work has steadily and rapidly progressed, until it now approaches completion.

Avoiding technicalities as far as possible, the following brief description will aid the reader to comprehend the fact that a great work of art, in its sublimest sense, is here in process of development.

Exteriorly the base, to a line with the marble floor, is of granite; above the base the walls are continued of Bellville or brown stone of the finest quality, cut to rest as it rested in the quarry, with its plane of stratification horizontal instead of inclined or vertical, every precaution being taken to add to the durability of the apparently indestructible material.

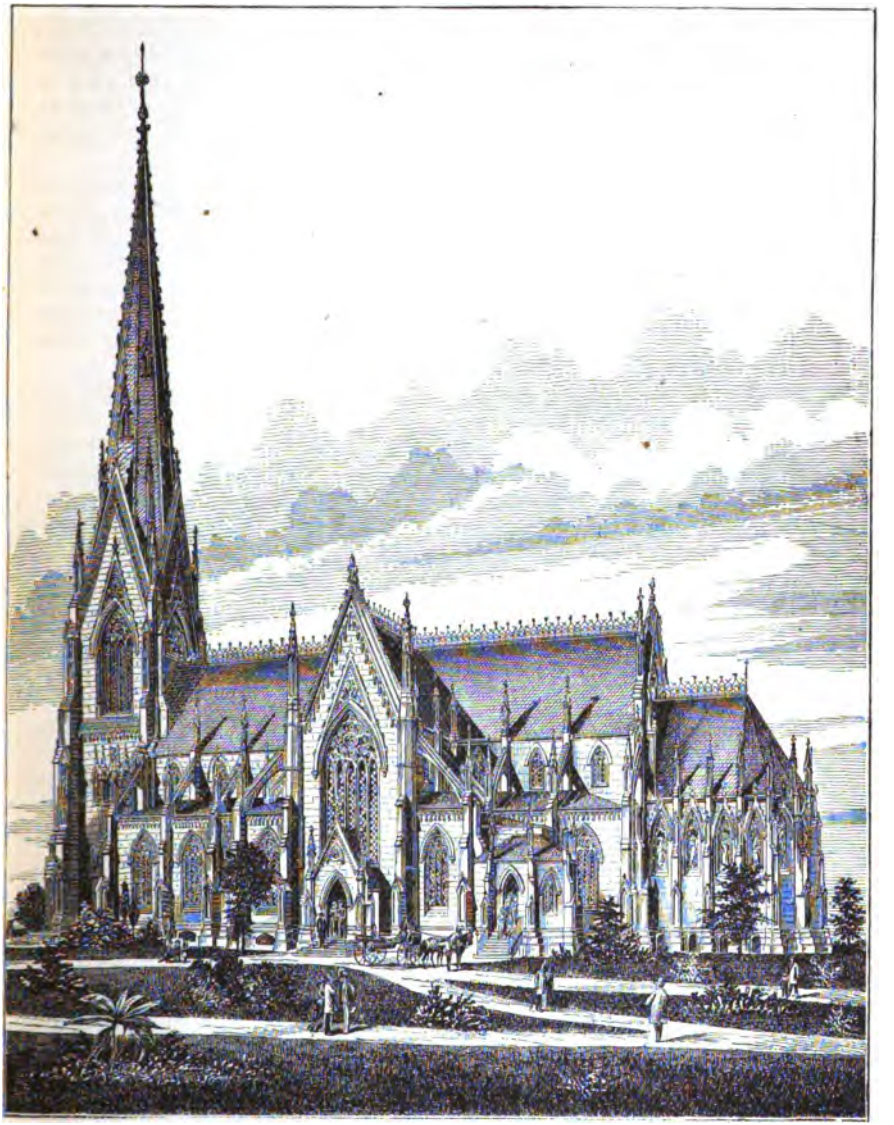
The façade is impressive in the imposing height of tower and spire, finished to the topmost with carvings in the solid stone, flanked on either hand with buttresses resting upon moulded bases, and surmounted by pinnacles ornamented with carved foliage. The windows and entrances are beautified with shafts having moulded bases and carved capitals, and arched with heavy mouldings resting upon carved corbels, the ornamental gablets terminating with fleuron.

The tower, monumental in design, rising to a height of one hundred and twenty-four feet, supports the delicately tapering spire, two hundred and six feet from the granite base. Springing from the corner abutments, and resting against the pinnacles at the walls of the spire, are flying buttresses, with their under arches moulded and finely finished with moulded coping: the pinnacles terminating in gablets with carved finials, the windows in the sides of the spire ornamented with buttresses and gablets finished with carved pinnacles and tracery. The aisle walls carry underneath the cornice a line of tracery resting on carved corbels, and otherwise enriched and ornamented, while from behind each buttress a gargoyle, with a decidedly fixed and stony gaze, stares unceasingly.

The gable walls are finished with a cornice and tracery resting on carved corbels similar to tracery of aisle walls, with a crocketed coping terminating with cross fleuron. Light is admitted through a spherical window of highly ornamental design, enriched with cusps and tracery enclosing a foliated circle.

In the tower will be placed the chime of bells which attracted so much attention at the Centennial Exhibition in Philadelphia. These were cast in Baltimore at the noted McShane foundry. The chime will be supported in the tower by frames of a novel plan and construction, and may be manipulated almost as easily as a parlor organ.

The tone of the bells has never been surpassed by any of American or foreign manufacture, and in securing this chime for the Garden City Cathedral the one peculiar remembrance so attractive in the cathedrals of Europe has been obtained, and with the memorable association of the *bell* with our national Independence, and of this *chime* with the Centennial, their religious significance is here intensified—as out over the beautiful plains will float the music of their tones, now appealing to and now expostulating with the hearts of men, as did the first bells dedicated to religious service by Paulinus, Bishop of Nola, over the Plains of Campania fifteen centuries ago.



CATHEDRAL OF THE INCARNATION.

The clear-story walls, supported by arches, are finished with cornice and tracery similar to that already described for the aisle walls. Flying buttresses spring from the abutments of the aisle walls to the walls of the clear-story, with moulded arches and coping. The windows have moulded jambs and shafts, with moulded bases and carved capitals; the moulding carried around the arch rests upon carved corbels and intersects with gablets ornamented with carved foliage, finished with fleuron, the face of the panel above the arch decorated with tracery. The mullions are of stone, moulded and connected at the arch with delicate tracery.

Niches of artistic workmanship are seen in each side of the transept walls facing the front, having projecting corbels and canopy with ornamental carving; the angles of the corbels moulded, the sides panelled and resting on a beautifully carved support at the base; buttresses are carried up at the sides, the ceilings groined, and the cornice ornamented with tracery, the corbels and canopy cut in the solid stone.

The interior is finished with Berlin stone of a delicate tint, and of a texture admitting the most exquisite carving in floral and other designs for mural ornamentation.

The wainscoting is relieved by tracery, and heavily moulded in solid stone. The clustered columns, with capitals carved in French bronze, support the groined arches, reaching upward fifty feet from the tesselated floor to the enriched pendants at their intersections. The windows, with their projecting mouldings, their variety of carving in delicate tracery, foliage, and flowers, with their graceful pinnacles lifted up in the rich light, are each a study and a work of art.

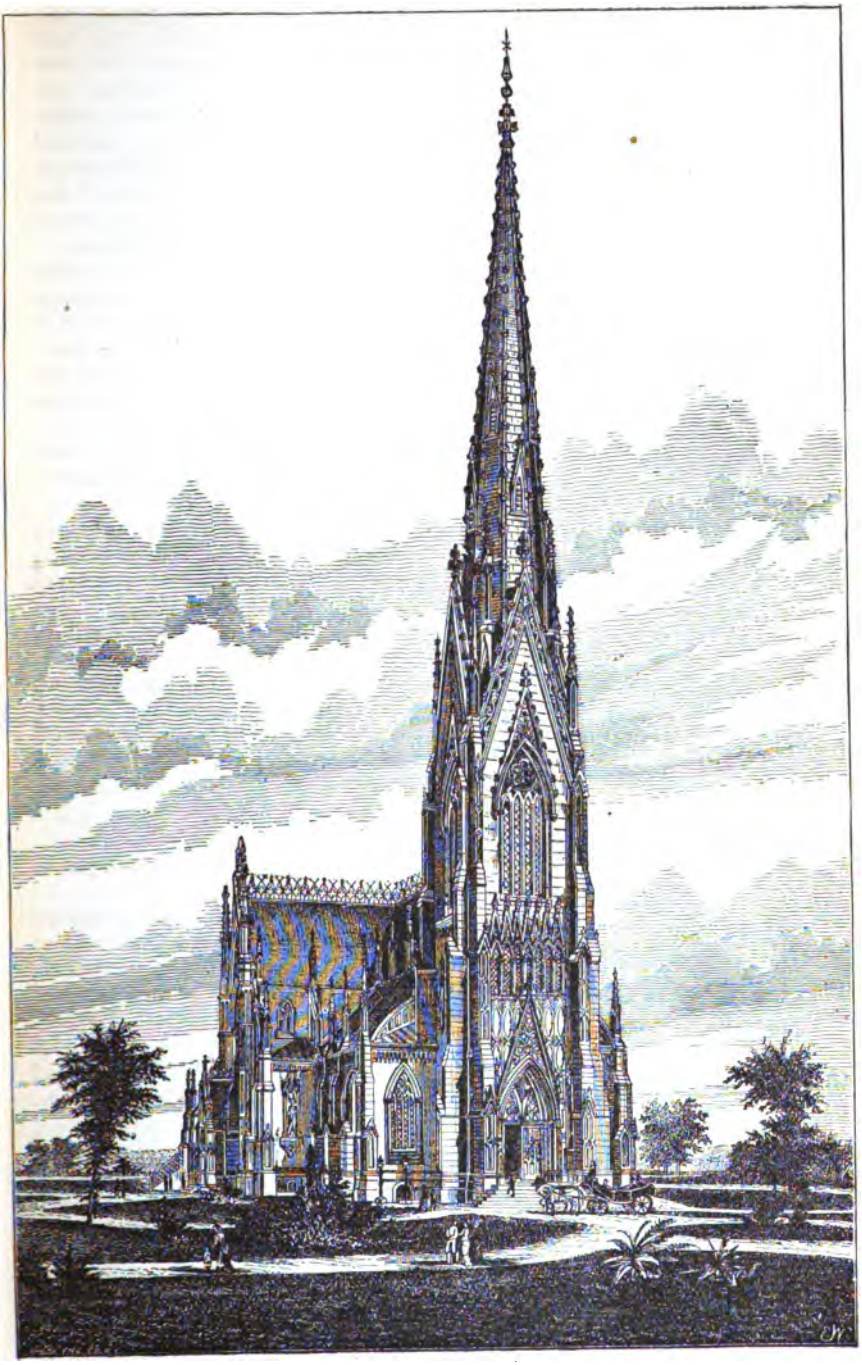
Around the walls of the apsis are placed the *sedilia*, or seats for the officiating clergy, twenty-four in number, besides the *Thronos* of the Bishop, and, with their projecting canopies, richly carved, form the surrounding of the *high altar*, beautiful structure of white marble, and a masterpiece of artistic skill.

Beneath the chancel will be constructed the CRYPT—a temple in itself—carved in marble of surpassing beauty.

To follow in detail the beauty and perfection of the interior decorations would exceed the limit of this notice; but here, as well as on the exterior, the architect has revealed himself the artist, in something more than moulded forms, clustered columns, and carved capitals. The harmony of proportion entrances the senses and throws over the whole a beauty indescribable. The unusual width of the transept renders the auditorium pleasant to voice and ear by its acoustic properties, and pleasing to the eye by the sense of space and freedom, while still preserving the cruciform plan.

The mystical number seven, variously used, adds a perfection of sentiment and poetry, which has not escaped the poet as well as artist in the architect.

The setting of this gem of the pure Gothic order of architecture, instead of being in arid metropolitan streets, is in a locality which will yet have a world-wide reputation for all that is most attractive to the eye and grateful to refined taste in landscape and architectural



beauty, and all the luxury that wealth can accumulate in its surroundings.

Approached by any of the various lines of railway, or by the substantial and well-kept carriage roads, worthy of the appellation sometimes given them of "Roman roads," the Cathedral seems firmly planted upon an elevated plateau, with gently rolling surface, here and there broken by valleys sweeping in graceful curves, robed in green, and enlivened by flowers and crystal fountains, shaded with trees luxuriant in growth, and of every variety known to the climate, fanned by delicious breezes, invigorating and exhilarating to both body and brain—and elevating to the soul.

"From this home of reverent worship and this centre of earnest work there shall go constantly the messengers of peace on earth and good-will to men, and in the Master's name and work shall kindle upon unseen altars the flame that shall illumine the world. And this Cathedral, which at once enshrines the memory of the departed and gives untold efficiency to the missionary capabilities of the Church, shall be both the instrumentality and the prototype of that sublime spiritual temple erected of human souls and cemented by a living faith—a temple which gathers its stones from many quarries, and hews its timber from the forests of many lands, and which, without the noise of axe or hammer or saw, is rising through the centuries to its glorious consummation in Jesus Christ, its chief Head and Corner-stone.

"The cathedral idea is an element in the organic life of the visible Church. It has been well said that its embryo was in the upper room in Jerusalem, where solemn conferences were held while waiting the coming of the Comforter. From then until now the necessity of a central rendezvous and rallying-point for the Church, a common altar and common conference ground in devotion and debate, has been profoundly felt, and this necessity has been relieved by the Cathedral.

"We rejoice, then, not so much over the architectural Cathedral, whose walls rise and beautify this broad-bosomed plain; nor again over the memorial Cathedral, which shall in silent eloquence move the present and coming ages with the story of human love sublimed in Christ, honoring and soul helping; but chiefly we rejoice over the great spiritual edifice whose corner-stone we have laid in the Master's name, whose walls shall be salvation, and whose gates praise through a far-reaching Gospel future.

"The Cathedral, in its whole idea, its theory and method, is designed to fuse into a holy harmony the whole evangelical work and devotional life of the diocese. To build a cathedral, equip it, and endow it, and then give it to God for the worship of His people, is something without precedent in the annals of Christian charity. And then how beautiful the blending of the wifely affection and the Christly devotion, making a mausoleum for the loved and lost of earth, and vaulting it over with a temple for the worship of the King of heaven."—*Rev. Dr. Snively at the Laying of the Corner-stone.*

WATER: ITS USES AND ABUSES—POLLUTIONS AND DANGERS.

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Abstract of a Lecture delivered to the inhabitants of Kirkintilloch, in the Temperance Hall, December 3d, 1877.

Water is a fluid at all ordinary temperatures, but becomes solid when the temperature falls below the freezing point, and changes into vapor when it rises above the boiling point. The degree of heat thus determines the physical condition of water. It is composed of two gases, named hydrogen and oxygen. One part by weight is hydrogen, which is inflammable, and is a considerable part of the gas burned in the street-lamps. Pure hydrogen has neither taste nor odor, and being very light, it may be used to inflate balloons. Oxygen, eight parts by weight of which are combined with one part of hydrogen in water, is a colorless, tasteless, and odorless gas. It is a little heavier than common air, of which it forms one-fifth part. In the air it sustains animal life, and supports combustion or fire by combining with the hydrogen and carbon of fuel. If oxygen did not exist in the air, man would die; and but for the oxygen dissolved in the water, not the oxygen of the water itself, the fishes and other animals of the rivers and seas would perish.

Water forms three-fourths of the weight of living animals and plants, and covers about three-fourths of the earth's surface. Professor Chaussier dried the body of a man in an oven, like a brick in a kiln, and after desiccation the body weighed only twelve pounds. Rather more than a pound of water is exhaled daily by the breath, about 1¾ lbs. by the skin, and 2¾ lbs. by the kidneys, making the daily emission of water by the body about 5½ lbs.

The following is the percentage of water in some well-known articles:

Wheat,	15	Mangel Wurzel,	85
Barley,	15	Cabbage (leaves),	92
Oats,	16	Do. (stem),	84
Rye,	12	Mushroom,	96
Rice,	13	Fungi,	87 to 95
Beans (field),	15	Potato,	75
Do. (kidney),	23	Water Melon,	94
Peas,	14	Cucumber,	96
Turnips,	88	Vinegar plant,	95
Carrots,	85	Wheat flour,	13 to 16

Rye flour,	14	Cocoa,	5
Barley flour,	14	Manna,	10
Maize flour,	13	Figs,	21
Indian corn flour,	14	Plums,	75
Oatmeal,	14	Apples,	80
Wheat bread,	44 to 48	Gooseberries,	80
Rye bread,	44 to 49	Peaches,	75
Cane sugar,	5	Egg, entire,	74
Linseed cake,	10	Milk,	87
Flesh,	77	Blood,	79 to 83
Skin,	58	Gastric juice,	97
Bones (variable),	7 to 20	Trout,	80
Beef,	74	Pigeon,	76
Veal,	75	Cheese,	40
Mutton,	71	Hair, wool, horn,	9 to 11
Haddock,	82	Brandy,	56
Sole,	79	Whiskey,	47
Tea,	5	Rum,	30
Coffee,	12	Beer,	90

Rain water, the water of the clouds, is the purest of all natural waters, and is next to distilled water in absolute purity. In a sense it is re-distilled from the lakes, and rivers, and seas, there being a constant interdependence among the sources of water. The beds of the great water receptacles are the stills, so to say; the sun's rays take up the pure water, which is condensed in the clouds, and, wafted by the winds over different continents, becomes liquid again in the genial refreshing shower, or the unwelcome torrent of rain. The rivulet and the river are thus again supplied, pouring their contents into the mighty sea, which is never full; for unto the place whence the rivers came, thither they return again. In towns, rain water is contaminated by atmospheric impurities—"the sewage of the air"—and with dust, leaves, and bird refuse on the roofs of houses. Rain water is thus modified by the locality in which it falls; near the sea it becomes slightly saline, and in the neighborhood of the smoking chimneys of public works it is not so pure as that which falls on the country house or small hamlet. The longer the shower of rain continues, the water becomes the purer. Rain water usually contains traces of ammonia, which is present in the atmosphere to a small extent; and, when preserved in old cisterns or barrels, it putrefies more readily than spring water. Though not well adapted for a drinking water on account of its insipidity, it is admirable for washing the skin and clothing and other household purposes. A heavy shower is a capital public scavenger, and some villages are cleaned only when a heavy fall of rain takes place.

Spring water takes its character from the nature of the soil whence it is derived. It is generally hard, owing to the presence of salts of lime and magnesia, agents which, unless when in excessive quantity, are not injurious to health. It is chiefly carbonate of lime that encrusts the insides of kettles and boilers; and till its hardness be neutralized with soap, washing with spring water is imperfect and unpleasant. When the hardness is due to sulphate of lime, boiling will not soften the water by throwing down the

lime, on account of the solubility of the sulphate. Carbonate of soda is sometimes put into tea-kettles in order to soften the water. Hard water causes an excessive use of soap by the lime decomposing the soap, and uniting with its acids to form the well-known curd that floats on the surface of the water. Any water which does not contain more than fifteen grains of solid matter in a gallon is considered not more than moderately hard. Absolutely pure water is not to be found in nature. The following are the characteristics of unpolluted water, as given by the Commissioners appointed in 1868 to inquire into the pollution of rivers: "It is tasteless and inodorous, possesses a neutral or faintly alkaline reaction, and is incapable of putrefaction even when kept for some time in close vessels at a summer temperature."—(*First Report*, vol. i., page 13.)

Through ignorance, neglect, and carelessness the water of spring wells is often poisoned with sewage, filth, and other impurities; and for the possibility of unpolluted water it is absolutely essential that wells be situated remote from ash-pits, sewers, and gutters. If situated at the bottom of a bank or hill, the well will receive sewage from the dwellings built at a higher level. Dip-wells should have a stone coping and fence, so that children may be kept back from them. The covering in of the well, and the erection of a pump, prevents the admission of leaves, dead animals, and other impurities. Every amount of care, however, will not prevent a well draining a large space around it, and in this way possibly receiving sewage. It would be safe to say that any ordinary well drains for each foot of its depth a radius of three feet. As an example of the distance to which dangerous matters may percolate to a well, it is recorded that some creosote poured into a trench near the workhouse at Carlisle, found its way to a well 200 yards distant, where the creosote taint was distinctly perceptible.

The water of springs contains atmospheric air, oxygen, and carbonic acid. When such water is exposed to the air, these gases escape, and the water becomes warm and insipid. No water that has stood in open vessels all night should be used for drinking or cooking. It has not only lost the freshness and sparkle which aeration gives it, but will have absorbed many of the dust germs floating in the apartment. Where spring water can be had free from sewage contamination, it is certainly pure and refreshing.

River water is made up usually from rain and spring water. Near cities and large towns rivers are converted, by the exigencies of public works, and the W. C. system, into open sewers, while in rural districts the streams are polluted likewise by agricultural operations and the cottagers living on their banks. Many rivers would contain a worse quality of water were it not that the neighboring soil around the different towns absorbs much of the sewage, and purifies it on its way to the stream. River water should not be taken for internal use, unless when procured from very high levels, removed from reach of contamination.

Lake water is supplied to some cities by gravitation. Its quality has been an occasion of frequent squabbling and professional profit among expert chemists and engineers; some claiming that a lake

or loch, remote from the haunts of men, should be the purest source of water in large quantities for all purposes; while others assert that lakes are almost stagnant receptacles for the *debris* of the hills—waste vegetable matter, the excreta of sheep and other animals, as well as a habitat for myriads of the water flea. The practical conclusion would seem to be that for drinking purposes, though not for cooking and washing, a little more hardness in lake water would be an advantage; while the color due to peaty matter gradually loses its intensity, owing to its being slowly oxidized, and the water fleas, in proportion to the volume of water, are as harmless as the fish that devour them. Filtering will catch the fleas and other tangible impurities.

There has been often given an interesting crowded picture of "the inhabitants of a drop of water," and there is no doubt that every stagnant pool or ditch contains thousands of infusoria or animalcules; but nobody of the least reflection would drink water out of a dirty ditch. Reservoirs for a day or two's use should be covered, so as to exclude light and heat.

There is always latent heat in water. In frosty weather, however, the heat leaves the surface of stationary water, and the frozen part is colder and even lighter, on account of its atmospheric porosity, than the water below. Were ice itself not a bad conductor of heat, the water would give out all its heat to the superambient air, and the pond or river would freeze to the very bottom. When the water is at 32° F. it freezes, and the greater the frost the lower it is below that point. The crystallization of water into ice is to be noticed on account of its expansibility. Cold contracts some bodies; at 39° it expands water to at least 1-12th greater bulk. This is of practical importance in connection with water-pipes led through houses. The frozen water, by its expansion, causes a rupture of the pipe. Nothing, however, may appear wrong till the ice thaws with milder weather, and "after that the deluge."

The youngest person ought to know the great danger that would arise from cold water getting into a shut red-hot boiler, a square inch of water being equivalent to a cubic foot of steam. There was a disaster in Manchester, in 1869, when a lady and a dog and cat were killed by the bursting of a kitchen boiler. During a time of frost the boiler had been drawn till it was empty, without gradual replacement by cold water. When thaw took place, the water rushed from above into the red-hot boiler, and the inevitable explosion followed. The remedy for an accident of this kind, as now constantly adopted, is to have the hot water supply cistern somewhere in the kitchen near the boiler, and not at the top of the house, where the water is apt to freeze in severe weather.

Polluted Water.—Hardness and softness are qualities of water, upon which there are honest differences of opinion; but there can be no doubt about the objectionable quality of water in which the presence of impurities can be proved. It is difficult to say how much chronic bad health is occasioned in towns and villages by water polluted with sewage and animal excreta; but there have been many glaring instances of fever and cholera epidemics where bad water

has been the originator and propagator of disease. The maladies most likely to be generated by polluted water are typhoid or bowel fever, cholera, and dysentery. Some families may possibly be more predisposed to typhoid or enteric fever than others—for instance, Prince Albert died of this fever; the Prince of Wales was nearly dead with it, and lately one of his sons was ailing with the same fever. Rich and poor alike suffer if exposed to the air of foul sewers, or the polluted water which sewage has contaminated.

It has been a question whether fever may be originated by foul water, or the poison of the fever be merely transmitted by the water. Dr. Murchison of London states—(1) That typhoid fever often arises from bad drainage, independently of any transmission from the sick, especially when the sewage stagnates and ferments; (2) Enteric fever not unfrequently breaks out in isolated country houses; (3) That, from the fact that nurses seldom catch this fever directly off the patient, the excreta become really more dangerous after decomposing in a drain pipe, which, unfortunately, may contaminate the water supply.

My former college chum, Dr. Macintosh, the medical officer of health to the Chesterfield Union, in whose accurate observation and conscientiousness I have the greatest confidence, says, in a report to the *Lancet*, May 9th, 1874, that in the short period of four months he has had twenty cases of typhoid fever spread in isolated cases over his district; and although he could not trace the fever to the presence of typhoid discharges in the water, yet almost all the cases were associated with sewage emanations and organic decomposition, some of them arising from polluted water.

Dr. Wilson, medical officer of health for the Mid-Warwickshire Sanitary District, who has studied the origin of typhoid fever in rural districts, is also of the opinion that this fever may be produced by water polluted with animal matter, though there be no specifically tainted matter. ("Handbook of Hygiene.")

Impure water takes greatest effect on the alimentary system. In 1854 cholera broke out in Westminster, London. In one small radius of 210 yards there were 486 fatal cases in the course of eight days. Dr. John Snow found that these unfortunate people had been drinkers of the water of a well known as the Broad street Pump. The water, on being analyzed, was found polluted with organic matter—small, white, flocculent particles, being visible to even the naked eye. Yet this was a famous water. It was used for mixing with spirits in all the public-houses around, and in all the dining-rooms and coffee-shops. It was even sold in little confectionery shops, mixed with a teaspoonful of effervescing powder, and dignified with the name of sherbet. A lady in another part of London was in the habit of getting water from the Broad street Pump sent to her in a large bottle. She died in two days. On the other hand, an army officer who dined one day at that time in a house near the pump, and drank of its water, died after a few hours' illness. The inmates of a neighboring workhouse and the workmen of a brewery escaped, because each institution had a well of its own. More deaths would have occurred if the frightened people had not fled early from the locality.

Why the water should have become so very bad at a particular time, Dr. Snow says: "As there had been deaths from cholera just before the great outbreak not far from this pump-well, and in a situation elevated a few feet above it, the evacuations from the patients might of course be among the impurities finding their way into the water, and judging the matter by the light derived from other facts and considerations, we must conclude that such was the case."

The measures which Dr. Snow recommends to provide against cholera and similar diseases are, briefly:

1. To effect good drainage.
2. To provide an ample supply of water uncontaminated with sewage, or the refuse of people on the rivers.
3. To provide lodging-houses for the vagrant class, and sufficient house room for the poor generally.
4. To insist on personal and domestic cleanliness among all the people.
5. To pay attention to ships arriving from infected places, in order to separate the sick from the healthy.

It is interesting to note the fact, that since Calcutta has been supplied with pure water, there has been a great diminution in the number of deaths from cholera. During the year 1870, the first year of the new water supply, the deaths from cholera were 1,563, being little more than half the lowest mortality during any previous year in which statistics are available. (*British and Foreign Med. Chirurg. Review*, July, 1872.)

In March, 1868, five males were sent to the fever wards of the Glasgow Royal Infirmary from the cottages belonging to the Garnkirk Fire Clay Company. The fever ward was under the charge of my friend, Dr. Robert Perry, who, remembering that a physician's duty is to prevent disease as well as remove it, communicated with the manager of the works, and went personally to the place from which the fever patients came. He found an epidemic of fever comprising fifty patients; and the whole source of the evil Dr. Perry traced to the use of water which had been contaminated with sewage and putrefying matter that had leaked into the water supply by means of a broken pipe. The surroundings of the course of the pipe were exceedingly nasty. Parties who did not use water delivered by this pipe were unaffected. Immediate measures were taken by the manager of the works to prevent the water being any longer polluted, and a marked diminution in the number of individuals attacked was observed to take place. In little more than a month indeed the fever epidemic subsided.

That malignant disease, diphtheria, may be conveyed by means of water. In May, 1877, the children of a hotel-keeper in Ellesmere were at Duddleston; and being thirsty, a glass of water was procured from a cottage, where, it subsequently transpired, a child was suffering from diphtheria, and one or more of the children at the door drank of the water. The deadly disease spread through the whole family of six children, and every one succumbed to it. (*Medical Times*, June 9th, 1877). Six lives were thus lost by the drinking of a cup of polluted water.

Water Analysis.—Though the analysis of water can be undertaken only by a chemist, yet some of the following directions will be easily understood and acted upon:

Color and Brightness.—When viewed in bulk, or examined in a tall glass tube on a sheet of white paper (looking down upon it), water should be perfectly bright and nearly colorless. Both of these conditions may be fulfilled, however, and yet the water be unwholesome, owing to organic matter of animal origin or other poisonous substances being in solution; and, conversely, neither of these conditions may be met, and yet the water be quite fit for domestic use—the color and turbidity being due to such innocent substances as are derived from peat (which has antiseptic properties), and finely divided suspended particles of sand and clay. Water that appears unusually bright may owe the brightness to dangerous matter in solution; but, as a rule, unless local circumstances warrant an opposite conclusion, the brighter and more colorless the water, the better the quality.

Smell.—Pure water has no smell. Any remarkable smell, such as that from fæcal matter, urine, or coal gas, will afford a good clue to the impurity. Shake up some of the water in a large bottle half full, the hand being placed over the mouth of the bottle, and then observe the smell. Warming water brings out the smell of bad water more decidedly.

Filtration.—A good filter removes impurities in suspension, such as sand, woody fibre, leaves, fungi, worms, and fleas. Bone charcoal, silica, and spongy iron are the best purifying agents in the construction of filters. Either of these not only retains mechanical impurities, but by its oxidizing power renders less hurtful any deleterious organic matter dissolved in the water. Sponge, flannel, and similar filtering media, break up by and by, and become themselves impurities. At best these remove only the grosser particles of suspended matter. A new filter should be run twice before water from it is used internally, and all filters should be overhauled twice a year, and more frequently if the water is known to contain matters which rapidly impair the power of the filter.

Boiling.—This probably destroys the vitality of every species of animalcule that may remain after filtration, although no one can say that even boiling will remove the infecting power of water contaminated with cholera or fever discharges. Most natural waters contain oxygen, carbonic acid, and other gases in solution. Boiling expels these, and precipitates carbonate of lime (chalk) when that agent is present in appreciable quantity. By pouring boiled water from one vessel into another for a few minutes, the atmospheric gases will be restored, and the insipid taste partially removed.

Hardness.—The more lime thrown down by boiling, the harder the water has been. Hardness is now stated in figures, by knowing how a sample of water with a solution of lime of known strength is affected with a standard solution of soap.

Incineration, or Burning.—As already stated, organic matter is the most obscure and dangerous of all undesigned impurities in water. It is of course the kind of organic matter, not the quantity merely, that affects life. Water may contain notable proportions

of vegetable organic matter derived from peat and such like, which, while it injures the appearance and occasionally the taste, does not render the water unwholesome. Even animal matter may become oxidized, and so rendered innocuous. This is particularly the case in running streams, when the flow is frequently broken by rocks and other obstacles, causing the water to be churned up with the atmosphere, the oxygen of which is the active purifying agent.

To estimate accurately the nature and amount of organic impurities in water is a work of some difficulty; different chemists adopt different processes, and while each process has its own good points, it is perhaps too much to say that any one process gives all the required information satisfactorily. The incineration process, which was wont to be almost exclusively relied upon, is now all but abandoned; but while it is unreliable as a means of estimating the quantity of impurity present, it is nevertheless serviceable as affording a clew both as to the nature and amount of organic matter present, and, with care, the process can be made useful when more refined methods are unavailable. Two pints of the suspected water should be taken and evaporated to dryness in a platina basin; towards the close of this operation the evaporation must be conducted very carefully at a temperature not exceeding 212° F. This can be best done in what is called a water bath. The residue thus obtained should be weighed and then ignited (incinerated). The organic matter, if any be present, will be decomposed; the residue at the same time becoming black, owing to the liberated carbon. While the process is going on, both eyes and nose should be on the alert. If nitrates, which are injurious mineral salts, generally of an organic origin, are present, ruddy fumes will be given off. If animal matter be present, then the odor will likely reveal it; and so with many other indications which experience will enable the operator to interpret. After the carbon has been burned off, weighing should again take place. The residue will be mineral matters; the loss in weight—organic matter, water of combination, etc.

The Permanganate Test.—This may be taken as affording an indication of the presence or absence of offensive organic matters. A few drops of Condy's fluid, which is a solution of permanganate of potash, and is a very powerful oxidizing agent, are to be added to a tumblerful of the water to be tested, and the effect noted from time to time. The more rapidly the solution changes, or loses its bright pink color, the more the water is to be suspected of containing unwholesome impurities. As iron has somewhat the same effect as organic matter upon the permanganate fluid, it is well to ascertain in the first place what proportion, if any, of that agent is present. This may be done by adding two or three drops of nitric acid to another tumblerful of the water, stirring well, and then adding a small quantity of a solution of yellow prussiate of potash. If iron be present, a blue coloration will take place.

Nessler Test for Ammonia.—This is a neat and reliable test for organic impurities in water, but its manipulation requires both skill and care on the part of the operator. When a small quantity of a solution of iodide of potassium, saturated with biniodide of mercury, and rendered alkaline with soda, is added to a solution con-

taining a trace of ammonia, a yellow or brown coloration is produced. If ammonia be largely present, a precipitate is formed.

Presence of Lead.—Cases of lead poisoning occasionally appear in the public journals. The action of lead on the body is manifested on the nervous system, causing the upper extremities to be semi-paralyzed; and the sufferers also frequently experience attacks of colic. The odor of the breath is leady, and if the case is an aggravated one, the presence of lead is exhibited by a bluish line on the gums where they join the teeth. Workers among white lead are special victims, becoming subject to colic, gout, spasms, neuralgia, and sleeplessness. In Tanquerel's book on "Lead Diseases," edited by Dr. Dana, the whole subject of lead poisoning is gone exhaustively into, and many illustrations are given of its bad effects. In one of the cases quoted the leaden pipe was one quarter of a mile in length. When iron was substituted for the lead pipe the lead malady disappeared. In two other examples of lead contamination the leaden pipe was three-fourths of a mile in length. 4,000 feet of a $\frac{3}{4}$-inch pipe will give a surface of 784 square feet, and the water being generally at rest, it became tainted with the metal. It is easy from this to understand why leaden cisterns for house supply and the manufacture of aerated waters are especially dangerous. In investigations made with regard to the prevalence at one time of colic in Devonshire, it was found, after an examination of eighteen bottles of cider, that each bottle contained a quarter of a grain of lead. This lead had been disengaged from the lining of the cider troughs.

In the neighboring parish of Campsie, in 1874, Dr. Wilson was perplexed with the symptoms of disease in a lady whom he was attending. After many inquiries the soda-water she was too freely drinking was chemically examined. In one bottle lead was found in the dangerous proportion of nine-tenths grain in a gallon. Dr. Wallace, of Glasgow, in his certificate, said that *four* bottles of this soda-water would contain a quarter of a grain of lead. Now, when one-tenth of a grain of lead in water is esteemed dangerous, nobody need be surprised at the aggravated illness of this lady, who was drinking half a dozen bottles of this soda-water every day.

Dr. Straton, Wilton, reports the case of a well at Stoford, from which a leaden pipe was conducted to a pump. By and by the inhabitants of the two neighboring cottages suffered from obscure dyspeptic symptoms; the horses in the stables also exhibited symptoms of slow poisoning. Suspicion led to the well, and about eight feet from the surface Dr. Straton found that the lead pipe, which ought to have hung free, had been allowed to touch the well wall, and was very much corroded for about eighteen inches of its course. Galvanic action had been set up by the contact below the water line, and solution of a quantity of lead was the result. The pipe was drawn away from the side of the well, so as to hang freely, the well was pumped dry for another trial, and all mischief from the lead ceased.

Having referred to horses, I may mention that in White's "Compendium of Cattle Medicine," sixth edition, great stress is laid on the propriety of supplying cattle with pure water—not only for the

health of the animals, but, so far as cows are concerned, for the quality of the milk, butter, and cheese. Mr. White gives examples of the improvement of cattle by means of a good water supply.

One part of lead in 750,000 parts of water gives a reaction with sulphuretted hydrogen. The test is effected by evaporating to a small bulk seven pints of the suspected water, previously acidulated with nitric acid; when, if lead be present, the addition of sulphuretted hydrogen will darken the liquid.

Leaden pipe is so easily bent and accommodated to the turns and angles in a house, that its use inside buildings is likely to be continued. It should never be used outside, however, for any distance; and I have been in the habit, when seeing a new pipe laid, to advise the house occupant to let the water run for three minutes in the morning before drawing any for food purposes, during at least the first three months of the pipe being put down, till a coating is formed on the inside of the pipe over the new lead.

There may now be had a composite pipe, which is a tube of pure block tin encased in lead so intimately that no tearing will separate them.

Lead cisterns, or any kind of cisterns, are objectionable for storing water which is to be used for drinking or cooking, water is so apt to absorb every impurity in its neighborhood..

An overflow pipe from a cistern should always terminate in an open channel. An outbreak of diarrhœa took place once among the prisoners in Salford jail. Their food, and the air of the rooms, were found quite good; but on examination of the water cistern the water was discovered to have both a strange taste and color. On further inquiry, the source of the evil was found to be sewer gas, which had ascended from the sewer to the cistern through the overflow pipe. When the cistern was cleaned out and the lower end of the overflow pipe was trapped, the epidemic quickly ceased.

For obvious reasons water pipes and gas pipes should be laid as widely apart as possible.

Uses of Water.—From what has been already said it will be observed that water has a most important share in the functions of the body. Where there is life there must be water: not only to maintain the bulk of the body, but to supply the waste which it sustains. Thirst is a sensation expressive of a want of fluid in the animal economy to supply the continual waste in the system. Fever and inflammation increase thirst, while the appetite for food is then sensibly diminished. Food is largely prepared with water; and when used by itself water facilitates the solution of food in the stomach—all tending to repair the losses going on in respiration and perspiration.

On account of diminished perspiration less water is required by the body in winter than in summer; and a man whose work does not cause him to perspire needs less water than a "heavy sweater."

There may, however, be too much of even a good thing. Drinking water at any time, unless when thirsty, is injurious, because excess of water weakens the gastric juice, and overworks the kidneys. No more than two tumblerfuls of water should be drank at

a time on any pretence. It may be taken in so excessive a quantity that the skin and kidneys cannot carry it off conveniently, and it remains in the system to embarrass for a time the solid tissues of the body. I have little faith in the excessive potations of ordinary water and mineral waters which some people swallow. Good may result from drinking an occasional pint of water, so as to flush out the body by setting to action all the emunctories. Two pints of warm water drank during the evening was Edmund Burke's favorite remedy for a bilious attack. Moderation is recommended by the best hydropathic writers. Dr. Balbirnie says: "In the healthy, drinking during a meal aids digestion, if the solid matters be of a nature to require it; and, on the other hand, it impedes digestion, if the quantity taken renders the mass too liquid. The healthy may safely trust their own sensations, which are often safer guides than any abstract principles. But to the dyspeptic we say, do not disturb digestion by *undue dilution* during a meal, or too soon after it. This relaxes the coats of the stomach, impairs its secretions, and paralyzes its movements. By drinking little at a time, the risk of exceeding proper limits will be avoided."

Cold water, unless in small sips at intervals, should not be drunk when the body is hot and fatigued; as either inflammation, or shock without reaction, may be the sad result. The shock is carried to the heart by the intimate nervous connection between the stomach and that organ.

A mineral water is ordinary water plus an extra quantity of salts and gases blended. The ingredients are derived from the soil or rocks through which it passes; and they consist principally of chloride of sodium, sulphate and carbonate of soda, sulphate and carbonate of magnesia, carbonate of lime, carbonate of iron, bromine and iodine, sulphuretted hydrogen, carbonic acid, nitrogen, or oxygen. Hot mineral waters seldom vary in temperature, and their heat is not readily accounted for.

Internally, mineral waters increase the excretion of waste matters from the system, acting both on internal organs and the skin, their influence being largely aided by locality, climate, absence from business, regularity of diet, friendly intercourse, and general regimen.

It is evident that people acutely ill cannot travel to this or that watering-place, and no watering-place will cure old age; but people with chronic complaints who can move about, say, with skin diseases, and stiff, rheumatic, and gouty joints, sluggish digestive organs, and nervous disorders, may derive a general benefit from being at a spa. About a month at a time is usually sufficient. Whatever the complaint and the water may be, it is safe to say that a couple of tumblerfuls night and morning will be ample for a beginning; and these drank slowly, not at a gulp. When used to that quantity, then a tumblerful may be taken during the day.

The external employment of water, though not so essential as the internal use, is of daily importance.

The necessity for frequently washing the whole body, and not merely the exposed parts of the skin, is perfectly obvious. Possessed of a sensitive network of blood-vessels and nerves, the skin,

by means of its pores, allows the whole body to be largely operated upon. Medicines can be absorbed by the skin, and through it, by means of water, both cold and hot, powerful principles in the cure of disease can be brought into play. This is not the time for going into the science of hydropathy, with its multiform baths, plain and medicated. Much good may have been done by hydropathic establishments, but they ought to be under the medical management of persons who have studied the anatomy and physiology of the human body. There has been at least one death in the Turkish bath; and even the sponging of the body by invalids should be undertaken with care.

The whole body should be bathed or sponged down at least twice a week. The poorest person may use a damp towel, drying well afterwards.

If engaged in a dirty employment, wash every night. Warm water may be used at night. Children should be washed every day. Washing or bathing, either at home or in a river or the sea, immediately after a meal, or when the body is chilled, is highly injurious; warmth and cheerfulness after a bath indicate that it has been beneficial.

Cold water is often useful in retarding the swelling of a sprain if, say, the sprained ankle is immediately wrapped up tightly with cloths wrung out of cold water. After an hour, if there be swelling and pain, warm water applications are preferable.

In cooling the hot head of a child mothers should be careful to make the head *cool* only, not icy cold. I recollect an infant who had congestion of the brain, and whose affectionate mother had assiduously applied the wet cloth for four hours, being rendered very pale and weak by nearly all the blood being driven by the persistent cold out of his brain. Warm fomentations had to be applied in order to restore the cerebral circulation. This case took such a hold on my mind that I wrote to Dr. Tanner, author of the "Practice of Medicine," whose method of treatment I generally followed. He answered me (August 31st, 1868) to the effect that the treatment by cold to the head had been occupying his attention, and that in the next edition of his book it would be fully noticed and guarded against.

When the volume appeared Dr. Tanner did caution his readers against the imprudent use of the ice-bag and the cold douche to the head, as being productive sometimes of great mischief.

The use of ice for iced drinks and desserts, and for the thirst of the sick, has increased very much of late. It is useful outwardly for sunstroke, while internally it is excellent for fever, sore throat, and an irritable or bleeding stomach. I do not approve of eating cold ices after a hearty dinner; the change is too abrupt for the coat of the stomach.—*Sanitary Journal of Scotland.*

UNSANITARY CONDITION OF THE PUBLIC SCHOOLS OF NEW YORK.

Proceedings of the New York Medico-Legal Society, February 6th, 1878.
Hon. G. H. YEAMAN, President, in the Chair.

Report of Special Committee to the Medical Society of the State of New York, January 17th, 1878.

NEW YORK, *January 14th*, 1878.

To E. D. STODDARD, M.D.; *Chairman of the Committee on Hygiene of the Medical Society of the State of New York:*

DEAR SIR: The undersigned, having been appointed a committee under a resolution of the New York Medico-Legal Society in relation to inquiries as to the sanitary condition of the public schools of the city of New York, beg leave to answer as follows:

Question 1.—Is any system of ventilation followed in your public schools?

Answer.—No. Ventilation is mainly by the windows during recess.

Question 2.—What method of heating is employed, and what kind of fuel is used?

Answer.—The rooms are heated by steam radiation supplied from boilers in the basement.

Question 3.—Are frequent observations of temperature made, and what is the usual average?

Answer.—Three times a day. In answer to this question a principal of the primary department in one of the largest grammar schools opened last year for the reception of pupils, says some rooms will not average 60°, others will average 80°.

Question 4.—Is the seating capacity in the lower grades sufficient, and what air-space is provided for the light?

Answer.—Limited: prescribed by the Board of Education.

An abstract from the report of the Special Committee on School Hygiene is here given to illustrate this point:

"At the outset of our inquiries our attention has been arrested by a report of the Committee on By-Laws of the Board of Education, under date of March 15th, 1876, not yet adopted, and recommending a continuance, or at best only slight modifications, of conditions which we are convinced are utterly inconsistent with due care for the preservation of the health of the children in the public schools. . . . We first notice the conclusion of your committee in regard to the amount of air-space required, and the causes of overcrowding." In fixing the sitting capacity of rooms, the following shall be a minimum allowance of floor-surface and air-space for pupils.

In the three lower grades of primary schools and departments, five

square feet and seventy cubic feet; in the three higher grades, six square feet and eighty cubic feet; in the four lower grades of grammar schools, seven square feet and ninety cubic feet; in the four higher grades, nine square feet and one hundred cubic feet. . . . Such a capacity of school-room space, though confessedly greater than that which now is and hitherto has been allowed thousands of children in the public schools of New York, is not, so far as we have been able to learn, consistent with physiological law, or with the opinions upon this subject of those whose scientific judgment is entitled to deference and respect.

The minimum cubic space in which the standard of atmospheric purity may be maintained without perceptible draught has been found, by actual experiment with the most perfect mechanical appliances hitherto devised, to be 424. This amount of space will admit of renewal six times an hour without appreciable draught.

Taking this at the lowest standard, and accepting the concurring opinions of all credible authorities, that with the *best practical means of ventilation* the margin for contingencies should be, at the least, equal in area to the demonstrated actual necessities, and we have upwards of 800 cubic feet at the lowest standard of allowance for twenty-four hours.

We would therefore recommend an adaptation of this amount to school hours. Every individual actually poisons fifteen cubic feet of air every hour. To prevent this, thirty cubic feet, at the least, should be provided hourly, which proportion, for five hours' daily school session, requires 150 cubic feet as the smallest space compatible with efficient ventilation without dangerous exposure to draughts.

Question 5.—Is any system of exercise or gymnastics followed?

Answer.—Simply calisthenic exercises.

Question 6.—Are the hours of school properly interrupted by periods of relaxation?

Answer.—No. There is but one recess during the morning, and none at all during the afternoon. For hours these little children in the gallery classes are obliged to remain without change of position, in constrained postures, packed as closely as it is possible to pack them. These classes average seventy-five; commonly two classes occupy this space.

Question 7.—Have any observations been made on the relation between the rate of sickness and the system of heating and ventilation?

Answer.—None. Some time since an order was issued directing teachers to report to the Board of Health cases of contagious diseases, and to dismiss from the school pupils residing in the infected house; also contiguous ones. This order is inoperative. The teachers have no means of acquiring this information but through the children, who are, as a rule, unreliable. Physicians do not, as a rule, report these cases. Moreover, among the former class—tenement population—physicians are not usually called in until the disease has assumed a grave character; the patients being frequently at the point of death. How then could the Health Board derive this information at such an early period as to make it available for

the protection of the health of the pupils? In the meantime other children of the same family, and those living in adjacent rooms, come to the school-rooms, spread the disease in various directions without the parents or teachers having any knowledge of its origin.

It is plain that these schools are not protected from exposure to disease. We recommend proper medical supervision to prevent this.

Experience has demonstrated that the only possible means of affording this protection lies in the appointment of competent medical inspectors of school-houses.

A bill making such appointment under the jurisdiction of the Board of Health passed the Senate last year; and it will be introduced again during the present session, and it is hoped it will become a law. The State Medical Society would materially aid the passage of the bill by its recommendation.

The chairman of the committee addressed notes to several of our most experienced teachers, requesting answers to the inquiries made.

These teachers have been connected for upwards of twenty-five years with their departments; and it is hoped that the information derived from this source will aid the committee in arriving at the conclusions desired.

We give abstracts of two of the communications received. One is from a lady who has been for many years an advocate of sanitary reform in schools; the other is from a gentleman who has also given considerable attention to the subject.

The lady referred to says:

"I emphatically protest against the dismissal of the children from the building *at noon*. The exposure of the little ones to midsummer heat and winter cold, and the damp and wet of all seasons to which the feet and clothing are always more or less subject, and which they must endure to the hour of dismissal; the marked variation of temperature, with insufficiency of food and dry clothing, or if sufficient, the absolute impossibility of personal supervision by the teachers of the bonneting and cloaking of hundreds of little ones, must lay the foundation of disease and dyspepsia, if not immediate, certainly remote. Do you think the clamored-for "hot dinner" is an equivalent for such serious risks to health and life? Again: the child, when the weather is favorable, runs home in a hurry, eats its mess in a state of hurry and excitement, and hastens back to its school work, without chance for any proper digestion of its food till after 3 P. M., the hour of dismissal.

"Since the noon-day dismissals have been in operation (*about ten years, more or less*), the general health of the children of my department has retrograded. The numbers are usually less in the afternoon, as many of the parents keep the children away upon the most frivolous pretexts. The hours should be shortened in primary schools. A lunch should be eaten in the building (as formerly), and the children dismissed at 1:30 or 2 P. M., for the day. Health imperatively demands this.

"I have not even alluded to other kinds of exposure in large cities

which are equally serious to mind and body—immoral street sights and sounds, personal risks in crossing the streets—from which all children, older as well as younger, should be shielded as far as practicable, but to which the children in our schools are subjected by this very detrimental (in result) noon recess, during which the children leave the building.

"The little ones are wholly dependent upon their teachers for physical, moral, and mental care and training."

The following is from a gentleman for many years past a principal of one of the largest grammar schools in this city, who has also given considerable attention to this subject:

"The source of all the trouble relative to the health of the children is due entirely to the faulty construction of the school buildings.

"The buildings should cover at least four city lots, be two stories high, no basement except cellar for heating apparatus.

"Janitor's apartments external, and internal play-ground on level with street.

"First story.—General assembly room, principal's office, teachers' room, closets placed in special wing.

"Second floor.—Large hallway class rooms on each side, well lighted, especially from windows placed at proper angle, Mansard plan; window to be adjustable for light and ventilation; shafts placed in each room opening to the outside; gas jet placed within; blackboard on both sides of room; seats and desks at least two feet from all sides, thereby allowing the teacher opportunity to pass to any portion of the room.

"Primary children in separate buildings; sexes in different buildings.

"It may be said this is not practicable in New York city, land is too valuable. Is land more precious than the flesh and blood of our children?

"There has been more stolen from the city treasury and more wasted in useless litigation than would pave the hallways of our schools with marble and ornament the assembly-room with works of art.

"Heating.—Steam heating is preferable, and should be placed only in charge of a competent mechanical engineer, not an ignorant janitor.

"Seating capacity.—While the law calls for seven square feet and ninety cubic feet in the four lower grades of grammar schools, in the four higher grades nine square feet and one hundred cubic feet, yet a strange fact can be presented that space allowed will permit of a greater number of pupils than actual sitting capacity will accommodate. When you grant at least ten per cent. of the register number off for absentees, you can closely approximate to attendance necessary for the room. In grammar departments the register should be placed at forty, average attendance thirty-five—sufficient number for any one teacher to properly instruct.

"Observations of temperature may be closely observed and record taken by principal; but teachers engrossed in class work never think of it, until attention is called to foul air in the room.

"Air-space.—The assembly-room should never be cut up and class-rooms formed, with folding or sliding doors and transom windows.

"These rooms are generally dark, poorly ventilated, and adjacent classes disturb one another.

"Gymnastics.—Practically out of the question; to be of any service should be taken in the open air.

"Hours of school duties for both departments too long; school should be opened in the winter at 9 A. M., closed at 1 P. M.

"In summer opened at 8 A. M., closed at 12 M. Afternoon sessions in summer almost impossible on account of heat. In winter children, should the day prove inclement, remain at home in the afternoon.

"Short sessions would enable the poor child to help parents by manual labor, and to all give sufficient time for study and relaxation.

"Sickness.—As reported by the Board of Health is very faulty, as you are directed to dismiss the children living in the contagious house, 'and not to readmit them during the time the contagion continues and until the apartment in which the sick child was, and the clothing, etc., have been disinfected.'

"You know sickness exists; how long since it commenced you do not know, and you never know when it ceases, and you never learn that the place has been disinfected.

"This plan is a good one for the chronic absentee or truant-player.

"A medical supervision is necessary, but to be effectual it should be confined to wards, and a competent physician appointed to each ward, his duties clearly defined, and a chief medical director to superintend the work and general duties of the ward physician.

"All of which is respectfully submitted.

[Signed] R. J. O'Sullivan, M.D.
F. H. Hamilton, M.D.
J. C. Peters, M.D.
C. S. Wood, M.D.
G. W. Wells, M.D."

REPORT OF COMMITTEE ON INTOXICATING LIQUORS.

The Committee on Intoxications, etc., report as follows:

Since the last meeting of the Society, when a preliminary report was made, the Committee have had the matters mentioned in said report under further consideration, the results whereof are embodied in the recommendations hereto annexed.

I. As to the adulteration of liquors with noxious ingredients, the Committee find that there are diverse opinions in regard to the extent of this practice. Some persons claim that distilled liquors, such as brandy, gin, etc., used in this State, are not adulterated to any serious extent, because such adulteration would not pay; that by the process now in use of manufacturing these liquors, no foreign injurious substance enters into the product; that the basis of all these liquors is what manufacturers call "high wine"; in other words, common alcohol, which is obtained from Indian corn by a

simple and cheap process of distillation, and that this is then reduced, colored, and flavored to resemble brandy, gin, rum, or whiskey, and sold as such; that the ingredients used to color and flavor these liquors and make them assume the appearance and taste of genuine cognac, gin, etc., are harmless, being such as molasses, burnt sugar, butyric ether, pine-apple ether, etc.; and that the worst which can be said against these adulterations is that they practise a harmless fraud upon the imbiber, while after all the worst thing in these liquors is the alcohol itself.

Others maintain that much of the beverage which is sold for gin, whiskey, etc., is vile stuff, containing an excess of fusil oil, and flavored and colored with noxious materials, which poison the body and destroy the mind. The truth no doubt lies between these extremes.

But in regard to wines, beers, etc., and liquors not made in this country, there seems to be no question that injurious adulterations exist to a large extent. Lager beer, which has become almost a national drink, and whose consumption has happily beguiled many from indulging in stronger beverage, and has therefore worked in the direction of temperance, is now largely adulterated with mixtures that are entailing upon their victims Bright's disease of the kidneys, destruction to the linings of the stomach, etc. Surely so long as persons will drink artificial beverage, be it tea, coffee, lager beer, or what not, it is the duty of the State to recognize that fact and institute safeguards to prevent the admixture therewith of poisons or noxious ingredients which form no part of the beverage in its purity. It is in this sense that the Committee have embodied the accompanying recommendations.

II. The Committee have not taken sides in the struggle which is now raging over the Excise law. But they believe that some modification should be made in that law in respect to light wines—wines containing but a small percentage of alcohol. As the law now stands, persons who are accustomed, say to claret wine for dinner, if they should have occasion or be compelled to dine at a restaurant or eating-house, not an inn, tavern, or hotel, would be denied their favorite beverage. The law, to be efficient, needs not expel these wines from such places.

The Committee therefore make the annexed suggestion is regard to light wines:

We would recommend the Legislature:

I. To adopt a standard of purity for all fermented and distilled liquors.

II. To pass an act against adulteration of all such liquors, making it an offence, with suitable penalties, for any person to adulterate with poisonous or deleterious drugs or mixtures any such liquors intended for beverage; or to bring into the State for sale, or to sell, or give away; or to order, or permit to be brought into the State, to be sold or given away, any such liquors intended as a beverage, knowing or being able to know, with reasonable diligence, that the same are so adulterated.

III. To provide for the appointment by the Governor, in each of the eight judicial districts, of a person possessing competent

knowledge, skill, and experience as an analytical chemist, to inspect and analyze all such liquors as may be brought to him for that purpose, and make a report thereon. He to be under oath to make in each case a true and faithful analysis, and report of the results thereof over his signature; giving in detail the ingredients of the composition. Such report and certificate to be, in the absence of other evidence to the contrary, *prima facie* proof of the matters therein contained in any action or proceeding before a court or magistrate. He to make quarterly reports to the Governor, stating the number of analyses he made during the next preceding quarter, and specifying the results of each analysis, and naming the sum paid therefor, if any. These quarterly reports, or copies thereof, to be annually transmitted to the Legislature by the Governor.

The analytical chemist should be removable by the Governor for cause, and should receive a fixed salary.

IV. The act should provide that the mayors and aldermen of cities, the sheriffs of counties, the supervisors of cities and towns, health officers, and the members of Boards of Health of cities and villages, and police officers and constables, especially authorized thereto, shall have the right to enter at any time, in their respective counties, cities, towns, and villages, upon premises where any liquor is manufactured, or sold to be drunk, to ascertain the manner in which the manufacturer or vender thereof conducts his business, and to preserve order; and shall have the right to take samples for analysis from any liquor made or kept for sale on such premises upon giving a receipt therefor; and the vessel or vessels into which such samples are put shall be sealed on the premises with the seal of the manufacturer, or vender, or his agent, or otherwise securely fastened up until submitted to the proper analytical chemist for analysis. The samples to be so submitted within —— days thereafter, and the chemist without delay to proceed to analyze the same and make his report. His certificate of analysis to be delivered to the person by or in whose behalf the sample was submitted for analysis, and legal proceedings may then be instituted upon such certificate within —— days thereafter. Every such manufacturer, or vender, or agent who shall refuse such samples to any person authorized by or under this act to demand and receive the same, shall be liable to a penalty of $——. The city, county, town, or village, where the premises are located to pay for the samples so taken, provided such liquor be found, on analysis, to be of good quality and free from adulteration.

V. Any person should have the right to purchase a sample or samples of such liquors, at the customary price, on the premises where the same are publicly kept for sale, and have the same analyzed by the chemist of the district where the liquor is offered for sale, on paying him therefor not exceeding $3.00 for each analysis, and receive from him a certificate of the results as above provided, upon which certificate legal proceedings may be instituted. The purchaser, on completing the purchase, should forthwith notify the vender, or his agent selling the article, of his intention to have the same analyzed as aforesaid, and offer then and there to divide the article into two parts, each to be marked and sealed with the seal

of the vender or his agent, or otherwise securely fastened up; and shall, if so required, proceed accordingly (otherwise he need not), and deliver one part to the vender or his said agent, and notify him of the time and place when and where the other part of such sample or samples will be submitted to the analytical chemist for analysis; and he shall so submit the same, if he deem proper, to such chemist, who shall divide each into two parts, and seal or otherwise securely fasten up one part and deliver the same to the purchaser on receipt of the sample, or on delivering to him the certificate of the analysis, which part the purchaser shall retain, to be produced in case of any legal proceedings, and the other part shall be analyzed. The certificate given upon such analysis shall be sufficient presumptive evidence of the facts therein contained, unless the defendant requires the chemist to be called, and the part of the article retained by the purchaser to be produced.

VI. The District Attorneys of the several counties, the Boards of Health of cities and villages, or the person causing the analysis to be made, may institute proceedings for a violation of this act before any magistrate or tribunal having jurisdiction of violations of the Excise law; provided, however, if a purchaser institutes such proceedings and fails in the prosecution, he may be adjudged to pay the costs, if it appear that he did not act in good faith. Further provided, that no person shall be liable to be convicted, but shall be discharged, if he shows to the satisfaction of the magistrate or tribunal before whom he is charged that he did not know that the article sold by him was adulterated, and could not with reasonable diligence have obtained that knowledge; but he shall nevertheless pay the costs of the prosecution, unless he duly notifies the prosecutor that he will admit at the hearing the matters charged against him in the information and stand upon the above defence.

VII. Husband and wife, in case either is accused under this act, shall be competent witnesses for and against each other in a prosecution under this act.

VIII. The magistrate or tribunal before whom a prosecution for adulteration of liquors is pending may, upon the request of either party, direct the chemist of the district to make the analysis of the article complained of, and give a certificate to the court of the results of the analysis, and the expense of the same shall be paid by the one or the other party, as the court may direct.

IX. Upon conviction of any violation of this act the license of the offender shall be forfeited, and no other shall be issued to him for the period of one year, and the adulterated liquor shall be confiscated and destroyed.

X. The fines imposed and received under this act to be appropriated toward the expenses of executing the same; the remainder, if any, to go to the proper authorities for the benefit of the poor.

XI. Every person who shall forge, or shall utter knowing it to be forged, for the purpose of this act, any certificate of a chemist appointed under the foregoing provisions, shall be guilty of a misdemeanor, punishable as such; and every person who shall wilfully apply to any article of liquor, in any proceeding under this act, a

certificate given in relation to any other article, shall be guilty of an offence and liable to a penalty of $—— fine.

XII. No manufacturer or vender of liquors to post or publish, or order or permit to be posted or published, any certificate, or purporting to be a certificate, of a chemist appointed under this act, under a penalty of $——.

XIII. Every manufacturer and importer of liquor to be used for beverage shall deliver for analysis to the analytical chemist of the district where the same is made or offered for sale a true sample, under oath, of each given quantity so made or offered for sale; such sample to be taken and delivered after the quantity to which it relates is ready for sale, and before any part thereof is sold or delivered. The affidavit to be to the effect that the sample so delivered is a true sample of the whole of such quantity, and that the same was taken after the liquor to which it relates was ready for sale, and before any thereof was sold.

Every person making a false affidavit in this behalf to be liable to the same penalties as if such affidavit had been made in a judicial proceeding.

XIV. Wines containing not exceeding fifteen per cent. of their volume of alcohol to be deemed light wines; and they should be classed with ales, beers, cider, etc., for the purpose of granting license under the Excise law, or provision should be made for granting special licenses to persons other than to keepers of inns, taverns, and hotels to sell such wines under proper restrictions.

All which is respectfully submitted.

[Signed] D. S. Riddle.
Jacob F. Miller.
William G. Davies.
Ed. C. Harwood, M.D.
E. C. Spitzka.

Dated *New York, February 6th*, 1878.

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New Fruits of Promise.—There are many new fruits which the originators laud highly, but they are heard of for a short time only. There are a very few which live longer, and obtain a greater or less celebrity. Among the fine sorts which have come into notice within a comparatively few years, the following are named in the last report of the American Pomological Society as having already succeeded in several States of the Union: The Charles Downing strawberry is recommended in nineteen different States, and President Wilder is named as a promising sort in fifteen States. Mammoth Cluster raspberry is recommended as a valuable variety in no less than twenty-eight States, and appears to be the most widely popular of all raspberries. Clapp's Favorite exceeds all pears for the rapid progress it has made in public favor, being now noted as worthy of cultivation, or as giving promise of value, in nineteen States. The Walter is marked as a grape of promise in twenty-two States. The Kittatinny stands above all other blackberries, and is recommended in twenty-four States, in seven of which it is named as of great superiority.—*The Cultivator.*

KINGS COUNTY "ALMS" HOUSE, N. Y.

Abstract of Report by one of the Members of the Local Visiting Committee of the State Charities Aid Association, read at their Meeting, March 21st, 1878.

In reflecting upon the effect of this Alms-house visiting upon ourselves and the women and children with whom we are thrown in contact, I think there are some serious questions involved, requiring great wisdom and caution, as well as concerted thought and action. We are made familiar with vice in some of its boldest, most repulsive forms—with infanticide, abandonment, desertion of families, etc.; and the knowledge thus acquired of the social sins in our midst may weaken our abhorrence of such crimes against humanity, instead of strengthening our horror of immoral, unchaste living; and these women, many of whom seem lost to every sense of shame, unless approached with dignity and judgment, may be emboldened in wickedness and have less realization of the great gulf between a virtuous and an impure life. When young girls, tempted to dishonor, can encourage themselves and each other with the knowledge that there are institutions managed by ladies ready to offer them care, protection, and support, and to assume the burden which should be theirs, it seems as though a premium were offered to dishonor and vice, and an influence exerted which thoughtful, true women would shrink from, did they realize it. I have no sympathy with that feature of the "Woman's Rights" movement which demands for women equal rights and immunities with men in social sinning and immorality. While we ought to insist upon the right of equal education and equal remuneration for equally valuable services rendered, we ought to rejoice that nature and custom have not given our sex the same liberty and license in vice; and instead of endeavoring to lower the standard of woman's virtue, or remit the penalty of immoral and unchaste life, we should for our own protection apply mercifully, yet with rigor, the exactions of a pure social code. It seems to me there is a lack of good sense and logical premises and conclusions in the desire so prevalent among truly good and philanthropic women to shift the responsibility of woman's lapse from virtue upon men, and even make heroines of young women who have swerved from the path of rectitude. They forget that if woman's responsibility is not sustained she is enslaved. By acknowledging that she is irresponsible we also acknowledge that she is inferior. If our courts can bring in a verdict of "*momentary insanity*," and *not guilty*, when a husband kills his wife's partner in sinning, and the mistress murders her guilty companion when he neglects her and returns to his wife and family, it follows conclusively that the wife is to be excused on account of her weakness and ignorance, and the impure unmarried

woman because of her uncontrollable jealousy and personal attractions, which impress the honorable and upright jury! Those who advocate equal rights for women should insist upon equal impartial punishment with men. Let the laws be upheld and murderers be dealt with in these as in other criminal cases, the guilty suffering the penalty of their crimes, be they women or men. This laxity and injustice, so evident in such trials, has its origin in mistaken sentiment and want of respect for woman, and leads toward the demoralization of virtue.

There are doubtless individual cases where injustice is done when the social verdict cannot restore the fallen woman; but this very strict partial code in the aggregate is the only safeguard women have, the only protection to the most sacred ties—marriage, motherhood, and the home; and these are being shaken to the very foundation in this country without exciting the attention of wives and mothers, whose life they are, by the loose Protean ideas now prevalent—the easy desertion and divorce laws, varying in nearly all the United States, which, taken advantage of separately and selectively, can in some one State tear asunder any marriage bond, in direct opposition to the laws of God, and of reason and right. In no other civilized country is this most sacred tie—which, if not considered a sacrament, should be a serious religious ceremonial—entered into with so little thought, caution, and formality. A boy and girl, under age, can declare themselves married for a little childish excitement; some youthful friend can read a marriage ceremony, the parties assenting, and this child's play or burlesque upon what should be the most solemn act of life is pronounced marriage. Two wayward children can, upon the impulse of the moment, call at the house of a clergyman and request to be married, and he can and frequently does pronounce them "man and wife," without the consent of parents or guardians, or knowledge of the circumstances. No record is even obligatory, as clergymen of this city have defied the new law of the Board of Health, requiring notices of marriages to be sent them. A man or woman can be divorced in one State in the morning and married in another the same afternoon.

Public opinion is the only check, the only drawback to the desecrators of these holy ties; and this, unless aroused by agitation and strengthened by stable laws, will soon become so mixed and uncertain that it will be little feared. A good woman may be openly and properly married, and a devoted wife for twenty years, rearing a family of children. The husband dies, leaving a fortune; and then there appears a woman, unheard of by her, who claims for herself and children a prior right in the estate, upon the ground that before his marriage she lived with the man and called herself his wife; and some one swearing they did thus live together, although there was no pretence of a marriage ceremony, the courts can decide her the deserted woman, and disgrace and disinherit the honorable and virtuous wife and her children.

There should of course upon such an all-important question, the vitality of the nation, be one head and one heart, a parent government, sending out its vivifying and healthful influence through every portion of the country. But here we confront the bane of our

Union, "State rights," the prolific fountain of evil, fed by the poison of human jealousies, selfishness, and ambition. We have represented in our country every race, and every type of liberalism and communism, drawn by the attractive sound of freedom, democracy, and republicanism; and as these, in many cases extreme and ignorant foreign adventurers and leaders, are admitted almost immediately to a voice in our State governments, there is the greater necessity for a central, stable, protective, comprehensive law regulating this serious and sacred question of marriage and divorce. To meet and remedy this growing evil, we who have no direct voice in legislation can and must make ourselves heard and felt. Our opportunities are in the household, where we can inculcate fixed moral principles and self-control in the youth intrusted to our care; in schools, academies, and colleges, where physical and moral education and submission to restraint can be combined with mental culture; and in our personal influence upon the master minds who have a voice in the councils of our nation; thus in effect establishing a Human Aid Society, without constitution or by-laws, but drawn and held together by the bond of Faith, Hope, and Charity—an all-embracing court, which shall regulate these vexed questions, fraught with such vital consequences, that lawyers, judges, and juries may no longer wrangle and quibble over the hydra-headed laws of marriage, divorce, and legitimate inheritance.

Brooklyn, March 20th, 1878.

Quack Medicines.—At a recent convention of pharmacists in England was urged the importance of fixing some legal limits to the wholesale poisoning of the public by patent medicines. It was proposed that even if it be impossible altogether to suppress the reaction of dishonest quackery upon vulgar superstition, the venders of nostrums be compelled to divulge the composition of their wares, and prevented from publishing mischievous and mendacious advertisements concerning them. Among the examples cited, including sundry "hair restorers," which, in direct contradiction to their advertised pretensions, contain poisonous quantities of lead, the most glaring one is a largely certificated "Sure Cure for the Opium Habit," which is found on analysis to give two grains of morphine to the dose, recommended to be taken thrice a day. It is scarcely to be expected that American apothecaries, most of whom derive the larger part of their income from the sale of these secret nostrums, will join in the crusade preached by their British cousins; but it would be well if the American public were taught that ninety-nine hundredths of the proprietary medicines which flood the market are the products of uneducated impostors, either wholly inert or positively deleterious.

NORMAL EXAMPLES OF AGRICULTURAL PRODUCTION OBTAINABLE FROM TOWN SEWAGE OR LIQUEFIED MANURE CULTURE.

By EDWIN CHADWICK, C.B., President of the Health Section.

From Address on Health, Twenty-first Annual Congress of the British Social Science Association, Aberdeen, September 21st, 1877.*

It will serve to show the states of intelligences that have to be dealt with, if I now state to you the normas obtained for the application of the excretory matter of towns to agricultural production, and the sanitary relations of those normas.

With long labor the experience of all Europe was sedulously collected on this subject, and not only agriculturists, but horticulturists, such as Sir Joseph Paxton, skilled in plant-feeding, were consulted upon it. The axiom was adopted of the foremost vegetable physiologist of the last century, Decandolle, "that the future of agriculture would be in giving food and water at the same time." Trial works were obtained on this principle. I persuaded the late Emperor of the French to direct trial works to be made with the sewage of Paris, and those as made by specialists (Professor Moll, of the Conservatoire des Arts et Métiers, and Mons. Mille) were in my opinion the best that have been made hitherto. We got out, at our Board of Health, a manual expository of all the experiences collected, which we issued for the instruction and guidance of local authorities. I have recently visited, with a sanitary officer of the King of the Belgians, some of our towns, where the principle has been moderately well applied, and I may state the normal results verified there and elsewhere. You may be aware that the highest agricultural results in weight of produce obtained over a given area is by garden, market-garden culture, with the most active tillage and the heaviest doses of manure—almost invariably with solid manure. The common yield from that culture is more than threefold the yield of ordinary good agricultural tillage. But the sewage or the liquefied manure culture, for various reasons stated in the manual to which I refer, everywhere exceeds the best solid manure culture, in quality as well as in weight of produce. The normal results obtained stand thus: Where the common agricultural yield is as one, the market-garden culture is as three and a half, and the liquefied manure or sewage culture is as five. Where the best of the ordinary pasture land carries one cow, the liquefied manure farms carry five, and the milk yielded is of superior quality. To give an extreme case. The sewage farm of Aldershot is on a close quartz sand, ten acres of

* Continued from page 161.

which would not have kept one animal alive; but under Mr. James Blackburn it now keeps four cows in milk and one growing animal. Mr. W. Hope, V.C., states to me that the ordinary allowance of land in Gloucestershire and Cheshire is from two to three acres to keep each cow the whole year, and he says: "One year I kept in capital condition between sixty and seventy head of horned cattle and fourteen horses for three months upon seven acres of sewaged Italian rye-grass." He estimates that each human being represents not less than 1,000 pounds of possible rye-grass per annum, and that "each human being represents eighty-five quarts of milk." He states, in answer to my question as to the waste of manure going on at present in London (and more or less in all our large towns), "that, taking the population of London at 4,000,000, they (the representatives of the vestries) are at present injuring the oyster and other fisheries at an expenditure of 340,000,000 quarts of milk yearly. But I give you this calculation purposely as greatly within the truth. Yet, taking only one penny per quart of milk as due to the grass, *i. e.*, to the sewage, and allowing as much more for the land, the farmer, and the cow, we have an annual preventable waste of manure that can be realized amounting to no less than £1,411,111; and again I say this credit of our penny is too little. I believe it will be found that this estimate is substantially correct." But there arises some important sanitary conditions in connection with the external agricultural economies of the question. Between sewage manure that is fresh or undecomposed and sewage that is putrid from having been retained in a state of decomposition, in cesspools or in drains of deposit, for weeks, or months, or years, until it is flushed out artificially or by storm, there is generally a difference of at least one-third. Putrid decomposition of sewage in ordinary weather in England, I have ascertained, begins in about four days, and discharged into rivers in that condition it kills fish; but when discharged from towns that have been water-closeted, through self-cleansing drains and sewers, that is to say, discharged immediately before decomposition begins, it feeds fish, and increases their number and improves their quality. The finest fish have been caught at the mouths of sewers of towns drained with self-cleansing channels, and where from administrative incapacity they have not tried, or have not succeeded in getting the sewage applied to the land. A case for litigation as stated to me illustrates the position of the sewage farmer in relation to the sanitary condition and the administration of the town. A farmer contracted with a town, which had been newly water-closeted and drained, for the whole of its excretory matter. On that contract he invested his capital in laying out a farm with appropriate farm buildings. But when he came to the application he found that the whole of the town had not been sewered as represented, and that much of it was badly drained, and that as a consequence he has had a less quantity of manure than he had contracted for, and that manure of an inferior quality. He has brought an action to recover damages, and, assuming the case to be as stated, he is justly entitled to them. The case is important, as showing the interests of agriculture in complete sanitation. But it is to be observed that the inhabitants, at the same time, have their injuries from the sewer gases generated and distributed into their houses from un-

skilful drainage. I recently visited Croydon with a sanitary officer sent by the King of Belgium, and asked: Were the 16,000 houses there all water-closeted?—Yes, they were. Were all the sewers self-cleansing and free from smells?—Not all; some were sewers of deposit. How so?—They had in one quarter of the town been badly jointed by the contractor. The sewage leaked out at the joints and permeated the site, and the flow being diminished, deposit was occasioned, and putrefaction and sewer gases generated, and outcries raised for sewer ventilation. Dr. Alfred Carpenter, a distinguished physician and member of the local sanitary authority there, and the engineer stated that, as a rule, the fever cases in the town occur in the district of the defective works, where the common prutrescent sewage of deposit generates sewer gases and foul smells —this interior injury to the health of the population having its exterior injury to the sewage farm in the reduction of the quality, the quantity, and the value of the produce. On visiting the sewer farm of the Camp of Aldershot, I went at once to the outfall, and said: "Why, this camp is badly drained?" "Had I seen the plan of the drainage works?" "No;" but I said: "I smelt that it was badly drained, for the smell at the outfall was the smell of putrefaction—the old sewer smell of the sewers under the jurisdiction of the London vestries." And it was so. It was the farmer's grievance that the sewers had been made large enough to receive extraordinary storm waters. As a consequence, the ordinary sewage, instead of being concentrated for a quick discharge, which, with properly arranged works, carries any gas with it from the friction of the water on the air in the pipe—has a retarded flow, which occasions deposit, and hence decomposition, and waste, and deterioration of the manure. Moreover, the deteriorated manure was at times brought down on that farm in such flushes, and so excessively diluted, as greatly to encumber the farmer's operations. I have found that from the defective engineering this is a prevalent defect complained of by sewage farmers, that will necessitate laying down separate and smaller sewers in conformity with the first principles enunciated. I may mention, *en passant*, another peculiar grievance of the farmer of the sewage of the Camp at Aldershot, as it elicited a strong illustration of the value of the manure. When he took the farm and executed his works for the reception of the sewage, the camp was a stationary camp of some 8,000 men. But since then the autumn manœuvres occurred, taking away the manure of his farm just at the time he most wanted it, and he bewails the departure in each man of his equivalent of the eighty-five quarts of milk, and of the "awful" expense to which he is put for artificial manures to avert the consequences of their absence. Added to the cause of irregularity and inferiority in the quality of the sewage from the admission of water which is not due to the field, but to the river, there is another and large cause of deterioration in towns by excessive dilution from the waste water from the house service-pipes. The common practice has been for the engineer to carry the water in the mains only to the doors of houses, and to leave the house services to be put in by common plumbers, without system and without supervision, and, as a consequence, with every variety of defect. We ascertained by gaugings that the waste of water in the metrop-

olis was full three-fifths of the water pumped in. In part this waste supersaturates the soil, and through defective drains and sewers makes it sodden with excrementitious matter; and in part it adds to the deterioration of the manure by excessive dilution. From these causes many a cry is raised that "sewage is worthless as a manure, as it is declared to be not worth more than a halfpenny a ton."

Putridity of sewer manure, the spoiled manure, assumed to be a constant, is used as a pretext for the refusal of land for it in the vicinity of towns, and for the exaction of excessive rents for land anywhere for its use as being injurious to the land as well as offensive to neighborhoods. Plain water irrigation, by the method of stagnant submersion, is, however, productive of fever and ague. Fresh sewage manure, if mismanaged so as to supersaturate the land and produce surface decomposition by stagnation, may be made highly injurious. But high culture, market-garden culture, with heavy top-dressings of solid manure, almost of necessity kept during long periods in states of decomposition before it can be absorbed by the soil, sanitarians know very well are injurious and unfit for the close vicinity of habitations. The way to prevent injury to the public health from such dressings with solid manure, and at the same time to augment its productive power, is to liquefy it, and apply it in the liquefied form in quantities adapted to the receptivity of the soil and of the vegetation, as horticulturists and the growers of prize fruits are skilled in doing. Examples were adduced, where, by this process, more than a double fertilizing power was imparted to a given quantity of solid manure. The common waste of the farmyard manures and of solid manures generally in common agriculture throughout the land, was estimated by the late Mr. Smith of Deanston, a distinguished agriculturist, as equivalent to an additional rental. At a time when town sewage was only known in its then condition of putridity—the condition in which even medical officers in old urban districts only know of it now—I got trials made on a small scale of a method of subterranean distribution through permeable agricultural drain-pipes. I got Sir Joseph Paxton to make trials of this method, and they were very successful. They, however, required great skill, and were comparatively very expensive. But the discovery that the condition of putridity was not a necessity, and the demonstration of the comparative freshness of the condition of the sewage from self-cleansing house drains and sewers, and of the inoffensiveness and the convenience and greater cheapness of surface-distribution, led me to desist from the prosecution of the method of subterranean distribution. Nevertheless, this method has been independently prosecuted with much success by the late Monsieur Charpentier, a vine-grower of Bordeaux, and I consider that it will be found to be eligible under certain conditions, especially for the culture of fruit-trees and of ornamental timber near cities.

It will naturally be asked how, with such a cheaper method of removal and conservation of the manure than all others—that by water-carriage—and with such cheap and convenient methods of application to the soil, and with such rich yields, exceeding the highest of common market-garden production, sewage farms seldom pay, and are generally attended with loss to the towns? In part this is explained by the mismanagement I have stated. Moreover,

sewage farming does not pay when the Legislature sanctions, as it has done, exactions of fivefold values for land; sewage farming does not pay when a town is put to as much expense for obtaining a local Act as would suffice for the construction of a first-class farmsteading; or when a town has been subjected to a Parliamentary conflict, and to such expenses as £10,000, to which Birmingham has, I understand, been subjected—a sum sufficient to have defrayed the expenses of preparing more than 1,000 acres of ordinary land; it does not pay when the engineering expenses belonging to the internal works of a town, such as the pumping-works for carrying away the sewage, which would have to be paid if it were thrown into the river, are charged to the farm; it does not pay for works of the ordinary scale of works of engineers who are not agriculturists, and not conversant with the necessities of agricultural economy; it does not pay when, to use the expression of Lieutenant-Colonel Jones, of the Wrexham Sewage Farm, in reference to so many examples "scattered over the country of sewage farms with massive vaults for tanks, and permanent carriers in places where they only encumber the ground and stop the plough, as well as of bad subsoil laid bare in ruthless levelling—when farming considerations are less regarded than the execution of those great engineering works laid out on the understanding that something solid was required by the rate-payers for their money, and that their engineers should be paid by a percentage on the cost of the works to be executed." Neither do sewage farms pay when they are subjected to the scales of expenses of municipal officers for unskilled service, or for inferior service that is not special, as "that of a common farm bailiff, at 25*s.* a week, to please some fifteen or twenty masters, town councillors, who have no experience in agricultural pursuits, but who must all have a vote, on entirely new and difficult farm management." But they do and will pay, as stated by Mr. Robert Rawlinson, and by Mr. Clare Sewell Read, himself a successful farmer, in the conclusion of their report on an examination of all the present methods of disposing of town sewage: "Where a fair rent is charged for suitable land, the sewage is regularly delivered, and a good market is close at hand, there is no reason to doubt that the return for capital judiciously expended upon sewage farms will produce a higher rate of interest than the money invested by the majority of tillage farmers throughout the country." It was not within their province, or those two able and practical men might easily have shown the conditions in which, after so much had been done to make the sewage of little worth, localities had been led, by railway or other insanitary engineers who know nothing of agriculture, to give no trouble about it, and to allow the construction of great tunnel sewers, to throw their manurial matter into the sea, at manyfold the expense that would have sufficed to effect superior applications of it for the production of food and the advancement of agriculture.

Market-garden farmers admit that sewage farms have great advantage over their culture in being supported by the constant regulated supply of water to the city, and in being protected from droughts and the irregularities of rainfalls. It may be added that the sewer manure farms have a peculiar advantage over the market-

garden farms, as well as ordinary farms, in the ready and superior means of feeding the plants by liquefied as compared with the common feeding by the solid manures. I have known a liquid manure farmer who regulated his plant-feeding as he wanted woody fibre, the leaf, or the fruit developed, and who at will could change the color of the leaves in twenty-four hours. This could not be accomplished with solid manures. By the liquefied manure culture the character of the produce is largely changed; there is a larger production of farinaceous and saccharine matter. The liquefied manure culture converts some plants almost into new ones. The sewaged rhubarbs have been sought for their excellence to make champagne or a superior still hock. The finest perfumes known are yielded for the boudoir of fashion from what would be the odious stench of the wynds or alleys. It may be hoped that this liquefied manure culture will develop and accustom the people to new and superior edibles as common food, to give relief from the terrible consequences of main dependence on single crops, an evil against which the increasing insect visitations are giving additional national warnings. This liquefied manure culture, with the excreta of cities, when perfected, will, I consider, be an advance of what I have heretofore contended for, as a principle of agricultural economy, the economy of what I have called "intensive" culture and food manufacture in narrow areas, as against extensive or thin culture over wide areas. For if we obtain, as has been shown by the established normas, a fivefold yield on the same area, there will be required only one-fifth of the extent of drainage for the removal of surplus moisture, one-fifth of roading, one-fifth of the space for the removal of crops, and one-fifth of the hedging or the outer fencing of farms. On the principle of intensive culture a higher order of works and of machinery may be afforded for food manufactures. In this view well-cultivated sewer farms may be made subjects of superior national agricultural instruction.

A metropolis, as the centre of science of an empire, with endowments from common funds for common benefit, may be expected to take the lead in the practical applications of science for the advantage in guidance of provincial cities. This becoming position Paris has maintained in what is called the "sewage difficulty." It has referred the subject to superior scientists and practitioners, who have expounded it in able reports for the information and guidance of the provincial cities of the empire. The French Commission has set aside at once the preposterous notion, got from the representatives of the vestries of London, of carrying the sewage of the metropolis to the sea. It rejects the principle of collection and removal of the excreta by the pail, of which Paris has had too long experience, and will proceed to substitute water carriage as soon as it is deemed practicable. It rejects all plans of intermediate precipitation, of solidification, of chemical treatment, of disinfection, and of the manufacture of patent manures, such as are in conflict in England, having had long experience of the inconveniences and the little advantage of the declining manufacture of *poudrette* in Paris. Having examined these projects in principle and in detail, it concludes by the affirmation of our principle of the uninterrupted and constant conveyance of all excretory matter possi-

ble by water-carriage direct to the land, and it has set the practical example of it, close to Paris, where, but for the interruptions of the war of 1870, it would now have been largely and systematically developed on a scale of agricultural grandeur. At present the applications have been chiefly by small farmers, and consequently in rude methods. But I trust that by the next year the sewage farming of Paris will have its place as an important adjunct to the International Exhibition. Dr. Folsom, Secretary of the State Board of Health of Massachusetts, has visited the chief sanitary works in Europe, and has presented a report upon his examinations, very much in accordance with the conclusions of the French Commission as to the superiority of the direct sewage applications.

There is one practice in cities passed by as a detail of no great importance in sanitation to which I beg to call attention. We found in London that at least 1,000 loads of horse-dung were daily deposited from the traffic on the streets. The interest of agriculture is that this mass of valuable fertilizing matter—some 350,000 loads a year—should be carefully preserved. But it is spread about, triturated, and a large proportion of its finest constituents lost by the evaporation which makes the streets at times smell like ill-kept stable-yards. So much of the street-mud, of which it is the chief constituent, as can be gathered up by hand-labor, is removed at intervals by the expensive method of cartage, so that the waste is very considerable. But the sanitary interest of the population is that the removal of it, as a source of the pollution of the air they breathe, should be accomplished as quickly as possible, and that they should not be obliged to breathe pulverized horse-dung, as they are, which forms by analysis the greater proportion of the mud and dust of the streets that so befouls the skin and the clothes as to require continual extra washing and labor to maintain cleanliness. The injurious effects of London street mud may be inferred from the experience of Mr. H. Graves, the print publisher, who states that an engraving may be cleaned from ink or from oil, but not from London mud. Now, the most effectual mode of street cleansing is by water power—by the jet from the hose and hydrant. We had complete trial works of this mode of cleansing, and found that whilst it was more rapid and effectual than cleansing by the broom, it was not half so expensive. It partakes in principle of the removal by the water-closet, and of the direct conveyance of the manurial matter to the land in the quickest manner, and placing it in immediate chemical combination with the soil, with the least loss. We also recommended the system for the collateral purpose of fire prevention, by having an apparatus available for the purpose always ready. Paris has adopted the method propounded, as did Hamburgh long before, with a large reduction of its fires; and as to that matter, I beg to mention, by the way, so has Manchester, Liverpool, and Glasgow, as to fire prevention, with a reduction of their previous losses by fire by two-thirds. By this method of cleansing an appropriate impermeable pavement Paris has acquired the name of "clean-streeted Paris." And it is noted by French sanitary authorities that marked improvements in the health of the inhabitants have followed the extension of the improved impermeable paving and of this mode of surface-cleansing.

Mons. Mille, the engineer-in-chief of Paris, has made a report on the works of sanitation for the metropolis of the German empire, Berlin, and he points out that they are on principle derived from the report inspired by myself. We might claim as due the acknowledgment of some principles and details of our original elaboration, that have been adopted in Paris, beyond those I have stated, as the abandonment of river supplies for spring supplies, a measure in which Paris is in advance of London.

My plan for the primary sanitation of London was first to put the whole of the water supplies under unity of management on a public footing. Successive Royal Commissions have reënforced that conclusion. We next proposed to abandon river sources of supplies, as of unavoidably inferior quality, if not from the sewage of towns which might be diverted from the surface washing of lands which could not be diverted, and we prepared to resort to spring supplies, of which we found in the Surrey sands springs of soft water of double the then actual consumption of the metropolis. Whether they would now suffice for the increased population, and what assistance would be needed and available from other sources, would be matter of inquiry. But the delivery of these spring sources would have been constant and direct to the house, without the intervention of any external subsidence or filtration reservoirs, or any stagnation in internal cisterns which would be unneeded and detrimental. The fouled water, with all excretory matter, would have been in course of constant removal through self-cleansing impermeable drains from beneath the sites of houses, and through self-cleansing sewers from beneath the streets and the site of the metropolis. By steam power mostly, such as that by which the fresh water was carried into the houses, the fouled water would have been carried from them, and be distributed in several directions on to land fitted for its reception. We prepared for the agricultural treatment of the sewage of the metropolis in at least four sections, pumping backwards to the south-west as well as to the north-west. By the concentration of pumps for sectional distribution, we should have increased falls and the rapidity of the discharge, and we were perfectly confident that as a general result there would be no stagnant fœcal matter in the metropolis, and that the whole of the fouled water would be deposited as manurial matter—not in suspension, but in chemical combination—in the soil within the day. Of the interruption of our preparations and expositions by an epidemic visitation of cholera with which we were charged to attend, and of the working in Parliament of the opposing sinister interests, it may be useful for public instruction to give an account hereafter. But it is for the immediate purpose of the advancement of sanitary science to state that the German engineers have (as stated by M. Mille), upon a study of our principles, adopted them, and are closely applying them for the sanitation of Berlin. The river Spree is perhaps one of the least objectionable of river sources, but collections of waters are now being made from beneath the sands near Berlin in close analogy with the proposed spring collection of water near London. These sands near Berlin, uncultivated and almost barren, constitute superior natural filters even of the rainfall, and the water so collected is delivered direct, on the constant system, to every house in that metropolis. A new and self-cleansing system

of sewers is in formation, and house drains are in course of construction and connection with them, for the constant removal of all excreta as sewage, and for its direct application to the land. The German metropolis is for this purpose treated in five sections, with a main pumping station for each; and the sewage will be pumped out by two lines of mains to two large farms on sandy land, like that of Aldershot, one farm north and one south, for which altogether about 4,000 acres of land have been provided. The house connections are not yet completed with closets, but one farm of about 400 acres is already in operation, and one crop has been taken from it, demonstrating the extraordinary development of productive power by liquefied manure.

On the occasion of a visit to Berlin the Governor did me the honor to ask my opinion of the plan for its sanitation, and I could not do otherwise than express my gratification at the affirmation they gave of our principles, and my confidence that if they were applied with completeness in the details, Berlin, from being the lowest in sanitary position, would be raised to the highest of any capital in Europe, and be made the worthy seat of the great German empire.

The old city of Dantzig has been made a sort of trial work of the principle of venous and arterial circulation. Water-carriage has been introduced there for a large proportion of the houses, and a direct application of the sewage to the land made by M. Von Weibe, the engineer, and Mr. Aird, the contractor, with complete success. A material reduction of an excessively heavy death-rate has followed the introduction of the system of water-carriage from the houses, and crops such as have never been obtained before from any culture have been raised from the adjacent lands. At Hamburgh, where I was credited by Mr. W. Lindley, the engineer, with the principles of sanitation applied to the houses; and at Dantzig, as well as at Berlin, the practicability of the system of water-carriage during long severe frosts has been established. At Dantzig, and subsequently at Berlin, the practicability of the regular distribution of the sewage to the land underneath the ice and snow has also been demonstrated, and the necessity of large storage reservoirs of sewage during the winter obviated. From his Excellency the Governor of Dantzig, Von Winter, I have received a very gratifying account of the public appreciation of the work of sanitation, marked by the increased application for houses where the works have been completed.

As far as my observation goes, in England, as a rule, the sewage of about one hundred persons may be utilized on an acre of ordinary land. Local conditions differ materially, and at Berlin, Mr. Holbrecht anticipates that he may be able to utilize the sewage of about half more of the population on that area. But he is of opinion that for efficiency and profit a smaller number will probably be found to be better.

On the whole, I submit, from such evidences, derived from increasing practice, that the venous and arterial system of sanitation for the protection of urban populations is safe for eventual general adoption with the progress of science, in respect to economy as well as for health.

Editor's Table.

The Alcoholic Treatment of Diphtheria.

BROOKLYN, *March 12th*, 1878.

DEAR DOCTOR: In reviewing my paper on diphtheria, published from the *Buffalo Medical and Surgical Journal* for October, 1877,* you inadvertently do injustice to my plan of treatment, and convey a false impression to your readers. You state my claims, but fail to give the facts on which they are based, and then falling back on *a priori* reasoning, come to the conclusion that I must have made a great "mistake." Your "personal experience," which has been "considerable," negatives my estimate of the virtues of alcohol. More than that, rum and filth go together—the more rum the more diphtheria—so that instead of alcohol being an antidote to the diphtheria poison, it "is a congener, calculated to intensify the poison and promote its effects: and no benefit can be ascribed to it on other grounds than *similia similibus curantur*."

Permit me to say, dear Doctor, that you never had any real experience in my mode of giving alcohol; and also that the inference to be drawn from the above quotation, that I am treading on heterodox ground, can have no weight with any one whose grand object in practice is to cure his patients. With your consent I will present certain facts that cannot be ignored. In the years '74, '75 and '76 there were reported in this city 6,649 cases of diphtheria, and during the same period the certificates of death from this disease were 2,355—a mortality of more than one in three. "From January 10th, '74, when I lost a young girl, ten years of age, to this date, September 15th, '77, I have reported seventy-eight cases of diphtheria, and lost one only." This came to me second-hand. "The child refused all food and medicine, and died in thirty-six hours." "To these seventy-eight cases should be added some eight cases, or more, which, from the slight local trouble, or other cause, were not reported; but which, from the course of the disease, I am convinced were really diphtheritic." . . . "Thus it appears that in a period of three and a half years, eighty-five cases of diphtheria have been treated successively without a failure. What is more, not a death appears under the head of croup, or other disease, the sequel of the diphtheritic poison."

This report was drawn up from the books of the Health Department, and is easily confirmed or disproved.

Since September, '77, I have had thirty cases of diphtheria, four cases in one family, two of which were complicated with scarlatina, and five in another, one of which was also complicated with scarlatina. Of these thirty cases I lost one. Thus you see, Doctor, there is a record of 135 cases of diphtheria with one death. Do you still say there must be a "mistake"?

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*THE SANITARIAN, p. 46, current series.

Since reading an article in the Kings County Medical Society, in substance the same as that published in the Buffalo *Journal*, many physicians here have followed the alcoholic treatment. One remarked to a friend that "it hit every time," and many boast of almost uniform success. Indeed, it is beginning to be an axiom here that the early free use of alcohol is all but certain to save the patient. Of this fact you can easily assure yourself.

Within the two years last past you are aware that two of our number have fallen victims to the fell disease in their devotion to their profession. All the resources of *rational* medicine availed naught.

The present winter two others contracted the disease whilst attending tracheotomy cases. Of course there could be no "mistake" about the diagnosis of such cases. These two physicians, Doctors Catlin and Hopkins, placed themselves on the "congener" of filth and sewer gas, and promptly recovered. The *empirical* remedy—one that I have had in trial since December, 1860; one that is "not a stimulant in diphtheria, but a febrifuge; is not an excitant, but a sedative; is not a tonic to support the strength, but an antidote to neutralize the poison"—came off conqueror, and that too in less than a week. If these things are facts, proven beyond a peradventure by actual personal observation, not only by myself but by many others, what, my dear Doctor, are you going to do about it? That is the question. Would it not be wiser to test the matter *empirically*, as many here have done, than to consign the pamphlet to the waste-basket, where all trash of the "*similia similibus curantur*" stamp meet their ignoble end?

Yours truly, E. N. CHAPMAN.

REMARKS.—We could not, if we would, ignore the fact that while the *forte* of THE SANITARIAN is the prevention of disease, the Editor does not shrink from challenging its treatment whenever that appears to him to be in conflict with the accepted truths of pathology and general experience. Dr. Chapman's treatment of diphtheria is by no means new to him. As a contemporary in the same field, he recalls not only his own published observations in regard to both cause and treatment, but also Dr. Chapman's, nearly twenty years ago, when Dr. Chapman first published his abandonment of caustic and mercurials, and his subsequent reliance on brandy and quinine.* The chief difference between Dr. Chapman and the Editor of THE SANITARIAN is that the latter long since abandoned alcoholic treatment in this disease, while the former has continued it so exclusively as apparently not to have allowed himself to become familiar with any other; and withal, with such success as to fully justify his course. But it is the misfortune of numerous other observers who have tried it, and ourselves among them, not to have found any such specific effects of alcohol. Moreover, in regard to this treatment, there is nothing new in it; and that Dr. Chapman's

* Transactions of Kings County Medical Society. Vol. I. (1858 to 1864), pp. 123 and 199.

particular "mode of giving alcohol" bestows upon it any new virtue, or that alcohol changes its nature in diphtheria, is beyond our comprehension. Besides, if alcohol is as beneficial as he claims, we should expect to find the increased use of it, after his example, to favorably affect the rate of mortality, which does not appear to be the case. Taking his own figures: In the years 1874, 1875, and 1876 there were reported in Brooklyn 6,649 cases, of which 2,355 died, or 1 in every 2.82. From January 1st to October 1st, 1877 (latest complete returns) there were reported 1,605 cases, of which 581 died, or 1 in every 2.76—an *increasing* ratio. "From certain facts, therefore, which cannot be ignored," from the Registrar's figures, "the axiom here that the early free use of alcohol is all but certain to save the patient," based though it is upon "almost uniform success," is shown by official statistics to be a fallacy—notwithstanding the accumulating cures of Dr. Chapman and his followers.

The Eucalyptus.—Prof. Samuel Lockwood, in *Popular Science Monthly* for April, adds a valuable chapter to the literature of the Eucalyptus, illustrated by a representation of the stem, leaves, and flower in the various stages of its growth, and dwelling not only upon the hygienic value of this tree, but upon its great value in an economic point of view. He observes:

"That the *E. globulus* has earned by fair experiment its name of fever-tree, as a preventive, seems now to be settled. Its rapid growth must make it a great drainer of wet soils, while its marked terebinthine odor may have its influence, and it is highly probable that the liberation of this essence into the air stands connected with its generation of ozone. But, whatever the sanatory activities of the eucalypt may be, the fact is squarely settled that spots in Italy, uninhabitable because of malarial fever, have been rendered tolerable by the planting of *E. globulus*, and it is believed that a more plentiful planting would nearly, if not quite, remove the difficulty. A military post is mentioned in Algeria in which the garrison had to be changed every five days, such was the virulence of the malaria. A plantation of eucalypts cleared the miasma nearly away, and rendered unnecessary the frequent changes of the garrison. In this case 60,000 trees were planted."

And of its economic value:

"When freshly cut the wood of these trees is soft, but so full is it of a resinous gum that it soon hardens, and becomes wellnigh imperishable. For ships, and docks, and jetties, it is invaluable. The terrible *Teredo navalis*, or ship-worm, lets it alone. It is proof also against that fearful scourge, the termites, or white ants. Hence, in India, eucalyptus-wood is used for the sleepers of the railroads, where it defies the insects and the climate. So great is the variety of the eucalypts, that they are provident for nearly every purpose which wood can subserve."

The emblem of THE SANITARIAN represents the leaf and flower of the eucalyptus globulus in *adult growth*, entwined with the poppy. Those who would gain a good knowledge of this remarkable tree should get the April number of *Popular Science* and THE SANITARIAN for May, 1876.

Death-rates per 1,000 inhabitants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Pox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Typs Fevs	Malarial Fevers.	Diarrhœal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500—4 weeks ending Mar. 23	2139	25.69	926	385		92	100	54	66	19	5	14	33	29	176
Philadelphia, 850,900—4 weeks ending Apl. 6	1186	16.99	384	223		34	53	4	31	6	27	11	6	8	79
Brooklyn, 598,000—4 weeks ending March 23	737	18.19	300	103		35	41	10	25	6	1		2	15	56
St. Louis, 500,000—4 weeks ending March 30	359	9.39	148	50		9	2		3	3	5	10	4	9	39
Chicago, 460,000—4 weeks ending March 30	523	14.6	269	76	2	13	6	7	9	18	9	10	6	4	59
Baltimore, 350,000—3 weeks ending March 23	365	18.26	144	59		27	4	1	4	4	5		2	1	29
Boston, 363,000—4 weeks ending March 30	565	20.38	430	119		38	2		9	2	10		11	5	
Cincinnati, 280,000—3 weeks ending March 23	272	16.88	108	43		7	17	6	5	2	5		9	4	23
San Francisco, 300,000—month of Feb	397	17.25	142	62		15	6	22	8	2	6		1		23
New Orleans, 210,000—4 weeks ending Mar. 31	437	24.5	111	60	41	4	1		7			13	19		29
Washington, 160,000—month of Feb	287	23.55	117	52		7	11		5		4	1	1	4	36
Pittsburgh, 145,000—															
Newark, 126,000—															
Providence, 103,000—month of Mar.	158	18.06	66	24		21	2	13	3	3			1	2	20
Milwaukee, 123,000—month of Feb	132	13.99	60	21	3	6	5		11		2	1	1	2	12
Rochester, 70,000—month of Mar	95	15.97	23	23		2	2		1			2		1	10
Richmond, 77,000—5 weeks ending April 6	124	16.78	102	16		3	8			1	1				10
New Haven, 60,000—month of Mar	94	18.44	31	14		4	6		1	2		1		1	
Charleston, 57,000—2 weeks ending March 16	72	32.89	30												3
Toledo, 50,000—month of Feb	46	11.04	19	6		5	1		3		1				2
Mobile, 40,000—month of Feb	74	24.11	19	21					1		4	2	1		9
Dayton, 36,000—4 weeks ending April 4	39	14.12		6						1					1
Nashville, 27,000—month of March	51	23.21	19	9		4	2	1		1	1		1		3
Wheeling, 38,000—															
Buffalo, 170,000—															
Knoxville, 13,000—month of Feb	17	17.04	10	1		2					1				4
Paterson, 40,000—															
Petersburg, 20,000—															
Selma, 8,000—month of Feb	17	23.12	6												1
Elmira, 20,090—month of Mar	26	15 23	9	5		3				1					1
Yonkers, 18,500—month of Mar	13	8.27	6												
Memphis, 45,000—															
Detroit, 115,000—															
Syracuse, 60,000—month of Mar	93	18.25	27	24		3					14				3
Reading, 40,000—															
Sacramento, 21,000—															
Minneapolis, 44,000—															
Bowling Green, 6,000—															

Foreign.—United Kingdom of Great Britain. During two weeks ending Mar. 9th, 12,147 births and 7,778 deaths were registered in London and twenty-two other large towns, and the natural increase of the population was 4,359. The annual ratio of mortality from all causes was, per 1,000, in London, 23.5;

Dublin, 32.4; Portsmouth, 15.7; Norwich, 27.7; Wolverhampton, 24.6; Sunderland, 21.3; Sheffield, 29.5; Birmingham, 27.2; Bristol, 19.9; Liverpool; 27.5; Salford, 24.5; Oldham, 25; Bradford, 21.5; Leeds, 19.2; Hull, 20.7; Newcastle-upon-Tyne, 24.3; Leicester, 18.2; Manchester, 28; Nottingham, 19.2; Brighton, 26.7; Plymouth, 30.8. Other foreign cities at most recent dates (week ending), per 1,000—Paris, March 7, 28; Rome, Jan. 26, 42; Vienna, March 2, 34; Brussels, March 2, 28; Berlin, Feb. 16, 27; Hamburg, Feb. 23, 25; Calcutta, Feb. 2, 35; Bombay, Feb. 5, 45; Madras, Jan. 11, 33; Amsterdam, March 2, 26; Rotterdam, March 2, 31; The Hague, March 2, 28; Christiana, March 2, 20; Breslau, March 2, 30; Buda Pesth, Feb. 23, 41; Turin, Feb. 23, 36; Alexandria, Feb. 28, 43; Copenhagen, Feb. 26, 24; Munich, March 2, 43; Naples, Feb. 4, 44.

New Haven.*—Population 60,000. The deaths for 1877 numbered 1,182. These deaths the health officer estimates represent an average sickness of 730 days each, or in the aggregate 862,860 days' sickness. At an average total expense of $2 per diem, they cost the community of New Haven $1,725,720, or nearly $29 for every individual of the entire population. This summary is made for the purpose of impressing upon the city fathers the cost of sickness as compared with the expenses incurred for its prevention, and in illustration of the contrasted wealth of health. The cost of the Fire and Police Departments, for the protection of property, during the year was $150,000; for the maintenance of the Health Department, for the protection of the health and life of the people, the amount of the appropriation was $2,000. The want of sanitary economy is still further illustrated by citing the examples of several populations in which the mortality has been signally reduced, and by comparing that of St. Louis, in 1875, with a death-rate of 14.46 per 1,000, with New Haven, of over 20 per 1,000.

The death-rate of New Haven for 1877 was 19.7; for 1876, 20.46, and the average for the last eight years 21.41. The prevailing causes for the last year were: Total from zymotic diseases, 348; cholera infantum, 86; scarlatina, 72; diphtheria, 67; croup, 42; consumption, 157. Births registered (exclusive of 76 still births), 2,294. Marriages, 502.

A growing interest in the care of the public health in New Haven is particularly manifest by the support and co-operation of the medical profession calling attention to and restricting visitors and funerals in contagious diseases, and the use of such general precautions as will best insure public safety.

Milwaukee.*—Population, 122,980. Mortality for 1877, exclusive of 171 still and premature births, 2,072; ratio per 1,000, 16.84. "The present administration of the Health Department received an inheritance of small-pox," which has continued to prevail disgracefully throughout the year, having killed 274, 111 *more* than in 1876. Of diphtheria there has also been a slight increase—99 against 95 in the year before; scarlet fever, 171 against 119; consumption, 189 against 162. Of the whole number of deaths, 759, or more than one-third, were caused by zymotic diseases; and from consumption, 1 in every 11 of the whole number of deaths. The large proportion of deaths from preventable causes, upon which we remarked a year ago,† continues to be a notable feature in the mortality of Milwaukee. The report before us is characterized more

* Annual Report of the Board of Health of the City of New Haven, 1877.

* Annual Report of Board of Health of the City of Milwaukee, Wis., for 1877, p. 154.

† THE SANITARIAN, Vol. V., p. 279.

by a diffuse summary of prevailing unsanitary conditions than by effective work—of which, for the period which it covers, there seems to have been but little. Had the everywhere-recognized means for the suppression of small-pox been prosecuted with an energy worthy of an enlightened community, the epidemic which still prevails there would have long since ceased. The common location of wells near privies, stables, and cesspools; "soil kept saturated with discharges from the kitchen and laundry; . . . sewer connections so imperfectly trapped that the sewer gas finds its way into the house; . . . the old system of having a vault holding the accumulation of several years, to be finally disposed of by buckets into an open cart," are all abundantly suggestive of criminal negligence on the part of the city authorities, who seem to luxuriate in the general prevalence of diseases caused by filth.

Chicago's* mortality for the year 1877, exclusive of 718 premature and still births, was 8,026—a decrease as compared with 1876 of 547. Estimating the population at 439,976, the ratio of mortality was 18.24 per 1,000. Of the total mortality, 35.71 was from zymotic diseases: scarlatina being especially prevalent, killed 810—19 more than in 1876. While this disease has appeared in different parts of the city uninfluenced by unsanitary surroundings, notwithstanding, "its fatality has been largely influenced by sanitary conditions." Diphtheria killed 331. While admittedly contagious, and liable to spread to some extent independently of its sources, the statistics of the report furnish cumulative testimony of its relations to filth. "Defective, broken, or detached sewers, with basements saturated with filth; catch-basins, full and offensive; houses filled with sewer gas; dark, damp, and crowded houses without ventilation; unsewered houses and neighborhoods draining all slops into street gutters; filthy personal habits, which in some of the unsewered localities can only be characterized as beastly—all this tells the story of diphtheria in the city."

Consumption killed 732—1 in every 11 of the total number of deaths. Pneumonia, 384.

Births registered, 7,448; "of no statistical value . . probably not more than three-fourths are reported."

Defective sewer ventilation and house-drainage are urged as chief causes of zymotic diseases, requiring a better sanitary supervision, with increased authority. The water supply continues to compare favorably with the supplies of other cities. Impurities in one wine gallon of 231 cubic inches, expressed in grains: Inorganic matter, 5.63; organic and volatile matter, 0.187.

The usual summary of administrative work, nuisances abated, etc., and expenditures conclude the report.

Newport.—Dr. Horatio R. Storer, in a recent number of the *Newport News*, is urging upon the civil authorities the necessity of immediate attention to unsanitary conditions, which if not speedily heeded are calculated to disgrace the place and bring distress upon those who resort thither. Funerals are said to be largely on the increase, but the civil authorities are purblind to the causes, and stand aloof from taking active measures for their prevention, lest such action attract public attention! The fashion papers, according to their wont at this time of the year, are writing up the improvements in progress and the prospects of a brilliant season. Hotel proprietors and other speculators are advertising steeple-chasing, polo,

* Report of the Department of Health of the City of Chicago for the year 1877, p. 78.

coaching, pigeon shooting, etc.; meanwhile diphtheria and other *filth* diseases are on the increase, and local conditions exist which are a disgrace to any people, and fraught with danger to all who come within the scope of their influence.

Magnesia.—We are frequently inquired of about "Phillips' Milk of Magnesia," which we advertise (as well as his excellent preparation of Cod Liver Oil, to which we took occasion to refer a few months ago), whether it is in reality what it purports to be, *magnesia*. Of this we are so well satisfied that we have for several years used it exclusively of all other forms of magnesia, and have not been disappointed. As an antacid and mild aperient, in dyspepsia and sick headache attended with acid stomach, magnesia is well known to be one of the best of remedies. For gastrodynia, a little magnesia a few minutes before meals is among the most certain means of relief. For acidity in the common indigestions of children it is one of the most useful of all household correctives. With its uses in bilious, rheumatic, and gouty affections—alone or in combination with other remedies—all physicians are more or less familiar. For convenience and eligibility of administration, equally serviceable in the cases of adults as in children, the *Milk* of Magnesia possesses advantages over all other preparations of that medicine.

Impure Water is so common and so dangerous that we take special pleasure in inviting attention to the Silicated Carbon Filters, advertised under the table of CONTENTS. They are the best of all Filters.

Medical Society Transactions.*—(1) *West Virginia Transactions* open with the address by the president, E. A. Hildreth, M. D., which gives a succinct presentation of the status, or rather the want of status, of the medical profession in the State, which, so far as legal enactments are concerned, recognises all persons as "doctors" who call themselves so, without regard to skill or qualification, shows the parsimony of the Legislature in rejecting the bill for the establishment of a State Board of Health, because the paltry appropriation of $1,000 was called for; gives the meteorology and natural history of the State, and a summary of the vital statistics. The address is evidently the fruit of much careful study and worthy of circulation throughout the State. State Medicine and Public Hygiene is the subject of a special report by Hugh W. Brock, M. D., but limited to a brief consideration of the Hygiene of the School-room and its Surroundings: construction, warming and ventilation, lighting, and defective clothing of school girls. The Importance of Pure Air—in regard to ventilation, by T. B. Seamans, M. D., and the contagiousness of typhoid fever, by J. M. Lazzell, M. D., complete the category of papers bearing upon preventive medicine, and constitute about half the pamphlet. The other half consists of short reports and papers on practical medicine and surgery by Drs. C. Shriver, Jno. C. Hupp, S. L. Jepson, J. M. Cooper, John Frissel, T. B. Camden, and J. M. McWhorter.

(2) *Georgia's Society Transactions* open with the address of the president, Robert Battey, M. D.: a tribute to *rest* from wear and tear in certain diseases of irritation—but no less applicable to the labors of physicians, which they would do well to heed. This is followed by the annual oration by J. S. Todd, M. D., on Medical Superstitions and the Influence of Mind over Body. Next follow about twenty special reports and

* (1.) Transactions of Medical Society, West Virginia, 1877.
(2.) Transactions of Medical Association of Georgia, 1877.
(3.) Transactions of Medical Association of Missouri, 1877.

papers on practical medicine and surgery, evincing the characteristic work of an industrious society. But we regret to find no papers on preventive medicine—the more since the sad demonstration of its great need in Savannah. Dr. Le Hardy promises a paper on the history, causes, etc., of the yellow fever epidemic of 1876, for the next meeting, and to give such historical and scientific facts as will controvert the conclusions arrived at in the second annual report of the State Board of Health.

(8.) *Missouri.*—I. W. Fraser, M.D., president, gives a stirring address on the importance of State Medicine, and especially for the prevention of the "Social Evil." Animal Vaccination, by R. M. Higgins, M.D., shows in brief the advantages of lymph thus obtained over humanized lymph. Syphilitic Phthisis is the subject of a paper by Wm. Porter, M.D., which shows that, inasmuch as syphilis reduces the system, weakens the power of resistance to disease, predisposes to fibrous deposit in the lung structure, resulting in arterial occlusion, predisposes to and aggravates the strumous diathesis and scrofula in general, it promotes and not infrequently causes phthisis. Summer Complaints of Children, by J. M. Allen, M.D., is a thoughtful paper on the predisposing and commonly preventable causes and treatment, which latter would be more valuable without the mischievous paragraph on the efficiency of alcoholic stimulants. The Middle Ear in its Relation to Treatment of the Nasopharyngeal Space, by H. N. Spencer, M.D., Subcutaneous Division of the Femur, by G. W. Brown, M.D.; Surgical Dealings with Sphinctre Muscles, by I. M. Richmond, M.D.; Cancer of the Larynx, by W. C. Glasgow, M.D., are all characterized by useful practical suggestions to all general practitioners.

Books and Pamphlets Received.—Duhring's Atlas of Skin Diseases, Part III.; Report of Cattle Commissioners of Rhode Island; Cholera of 1873—W. R. Sevier, M.D.; Population of Providence—E. M. Snow, M.D.; "The Blood is the Life"—Joseph Wheeler; Nashville Legal Reporter for April—Jerome Baxter; Proceedings of Louisiana State Med. Association; Etiology of Intemperance—Charles W. Earle, M.D.; Scarlatina—C. W. Earle, M.D.; Report of American Society for Prevention of Cruelty to Animals, for 1877; Report of Board of Health of Baltimore, for 1877; Proceedings of Association of American Institutions for Idiotic and Feeble-Minded Persons, 1876-77; House-Air, the Cause and Promoter of Disease—Frank Donalson, M.D.; "Trismus Nascentium"—D. W. Bliss, M.D.; Hydrobromic Acid—E. R. Squibb, M. D.; Report of City Registrar, Charleston, S. C., for 1873; Tramps—Prof. Francis Wayland; Report of New York Society for Prevention of Cruelty to Children; Baths in the Treatment of Diseases of the Skin—I. V. Shoemaker, M.D.; Comparison of European and American Climatic Resorts—George E. Walton, M.D.; Management of the Insane—R. S. Dewey, M.D.; Clinical Lecture on Surgery—J. H. Pooley, M.D.; Local Causes of Insanitation in Baltimore—John Morris, M.D.; Report of Pennsylvania Training School for Feeble-Minded Children, 1877; Report of Pennsylvania Hospital for the Insane, 1877—T. S. Kirkbride, M.D.; Treatment of Pott's Disease by Suspension—Lewis A. Sayre, M.D.; New York Hospital, Report of Building Committee, with Address by W. H. Van Buren, M.D.; Source of Muscular Power—Austin Flint, Jr., M.D.; Report of Willard Asylum for the Insane, 1877; North American Homœopathic Directory, 1877-78—J. Pettet, M.D.

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THE HYGIENE OF THE INDIVIDUAL AS RELATED TO THAT OF THE NATION.

By W. R. BARTLETT, M.D., New Haven, Conn.

The individual as a unit is made up of certain primary elements, and is governed by fixed laws, and a violation of these laws brings upon himself disaster. He is by nature ignorant of the laws of healthy living, by inclination also, because laws imply restraint and a correcting influence; by education he may become still more ignorant of them, if their importance is ignored; but if realized, education develops an appreciation of them; if it commences early in life the man grows into it naturally, and it never becomes complex or irksome. He, by it and its observance, grows in strength, develops, broadens, has a well-balanced mind, prolongs his life, benefits himself, helps others, his moral character grows healthful, and his social views become high and elevated. Man's advance comes from the application of mind to externals and its mastery over them, and the knowledge and observance of nature's laws in regard to health, curiously enough, have always been of the most lax and negligent character. Man trains his mind, but neglects his body; he treats it as a tool to carry out his purposes, as something from which a certain amount of pleasure, or gain, or work, can be obtained, and feels himself so much better off; for did his body cost him anything, did it not grow like animate nature about him, and does it not die sooner or later? so it must be used while the time lasts, and only be made decent and clean for other people to look upon. Hygiene modifies this order of reasoning, and makes the body coequal with the mind, sees a reciprocal influence of the one toward the other, and demands that both be treated and cared for with unceasing vigilance. The hygiene of the individual has then to do with his whole nature, both mental and physical; it touches the whole man; its renovating influence renews his whole body, cleanses his mind from all narrow bias, and overcomes the vitiated and perverted tendencies which heredity imparts.

The nation is made up of individuals, consequently the nation as a whole is a unit, having attributes analogous to those possessed by the individual, and having for its ultimate elements man and his operations in nature; so its ignorance is the same, its variations

from the healthy standard the same, its diseases, decline, or advance are all similar. An individual embarks upon some scheme of personal advancement; his health gives way, and he fails. A nation undertakes the acquisition of territory; if its credit is bad, its government faulty, or its people improvident, it fails in the enterprise. It follows, then, that anything which affects the individual affects also the nation; the more it touches the person of the one, by so much does it take hold on that of the other. Here, then, is found a way to the solution of those social problems which underlie and agitate society. Here the social scientist finds a rich storehouse for investigation, and along this tenuous interwoven thread he gropes his way through the woof of an ever-changing social fabric; out of these principles has come the science of sociology, and here the student of hygiene must begin to rationally weigh and consider the questions of public health.

Let us consider some of these aspects of the individual man in a hygienic point of view which bring him into intimate relation with the nation. The whole matter may be stated thus: A course of action which brings upon the individual ill-health is typical of a similar course and result on the part of the nation; and a course of action which brings upon him good health also stands for a similar course on the part of the nation at large. If uninstructed or wrongly instructed as to the personal care of his health, man is sure to go wrong or indulge in some excess; if this error leads him to believe that it is a part of manhood to inure himself to cold or to excessive fatigue, he will take little care as to his clothing, he will not cease from action when he should do so, but will purposely subject his body to cruel and unjust neglect; and, as an ultimate consequence, the result will be disaster. Again, he will allow a defective drain to poison his well through ignorance or procrastination, until he or his family fall victims to typhoid fever, and he reaps a harvest of death, which he has sown as truly as when with the good he cast a defective seed upon the ground which in its development brought forth a blighted fruitage. In the former case he pursued a fatal course blindly and with good intentions, and, like the bigoted enthusiast, dashed out his life against the limiting walls of law through which he vainly sought to penetrate. In the latter, without intention and from a fatal want of knowledge, he allowed the causes of death to draw their toils about him.

Now turn from the single man to the collection of men, and try to imagine some of the results which would flow from a parallel course of conduct on their part. Here, in place of the ruin of one person, we behold a vast multitude going in the same pathway, and the fearful spectacle of self-destruction on a commensurate scale —a destruction as blind as that which leads the victim of religious fanaticism to cast himself beneath the wheels of his idol; and here, also, in place of the neglect of one, we see a similar neglect on the part of the many, and the consequences of a seed sown broadcast over the land, of sickness, mourning, and death. And this effect reaches still further; and we have only to clothe the nation in the concrete with the attributes of life, and there appears a being sick in all its members, perverted in its course of action, seeking its own destruction, striding like a giant over hill and dale to a peri-

lous abyss of woe, or carrying about in its bosom a fatal sore which sooner or latter will bring it down to bankruptcy. or social and moral ruin. When the effects of this social wrongdoing are followed out in their remote ramifications, the result is something appalling; but their operation is but the repetition of a law of the natural world whose illustrations are familiar to every one; the continual dropping of water wears away the solid rock from its geologic bed, and lets it go tumbling into the chasm below. The seed of the Canada thistle which a chance bird of passage or the wind drops in some fertile field gives the farmer many anxious hours of toil in its eradication; the coral insect builds up the rock on which the unsuspecting vessel goes to pieces; and—common lore and common experience are full of such examples of accumulated results from the humblest beginnings.

Just so the filthy woman, in a dirty city in Egypt, and her filthy lord vegetate with their squalid children amid dirt and defilement; a neighbor follows their example; a whole city does likewise; and suddenly, as if by the waving of a wand, a plague of death sweeps over the place, bringing famine and unutterable sorrow upon it. At its early inception a vessel laden with merchandise intended to bring comfort and food, it may be, to many homes, sails for some American port. She arrives, and discharges her cargo, and departs; but she has brought, like the bird or the wind, the seed of pestilence, and the cholera sweeps like a raging fire through its dirty limits, made ready for it by sanitary neglect. Again, in cultured New England, in some healthy nook in a pleasant village, a germ of scarlet fever is brought from an infected household in the distant city by means of clothing or article purchased, or a public conveyance; it germinates in one of the fairest children of the place; she carries it to the public school; a dozen other children are likewise infected; and that valley of comfort is transformed into one of mourning for the first-born. Is this sentiment? Is this romance? Truly, it reads like it; and better were it so, save only that its lesson of warning would be lost to us who need it.

The influence of this principle of individuality upon the government of a people is of vast consequence, and fraught with effects of the deepest import. Physical and mental soundness have a vast significance where the individual is placed in a position of executive power or trust. Place an ill-developed, unhealthy man in office, and bring him into contact with his fellows in the conduct of affairs, and he carries the same bias of mind there, in the discharge of his duties to the public, as he uses in the government of his personal affairs. Is he dyspeptic, rheumatic, or his brain diseased; is his nervous system disordered; are his animal propensities developed to an inordinate degree? then with what black spots will his administrative career be darkened, and what a mass of ill-humor, bad judgment, dwarfed effort, misappreciation of the public mind and need will obstruct his career; reforms will be nipped in the bud, and excrescences will blot the public features. Put him upon the judicial bench and justice will be perverted, and he will weigh with uneven balance the defects and infirmities of his erring brethren. Let him be in the ministry, and with what morbid, narrow, or perverted bias of mind will he expound the truths of the

Gospel. Place him at the head of the nation, and here he will give forth the same perverted effort which will manifest itself in a similar but more extended effect upon the people. It will be well to particularize some of these diseases in detail, which, though not popularly classed as such, yet none the less come under that category, and belong in the domain of hygienic influence.

Intemperance is one of the most important of these vices, and it will not be necessary to discuss the question as to what extent, in a given case, it is a disease, or heredity, or weakness; it will suffice to say that in its broadest sense it is emphatically a disease; and in its immediate and remote effects a breeder of disease; and the number of inebriate asylums springing up at the present time under medical supervision and treatment bear witness that the present conception of intemperance is that of a disease. Now place a victim of this infirmity in authority, and what is the result? I need not elaborate it, for it has been too often thrust upon the gaze of the public as a source of misfortune to need it; and not alone in the public administration, but as well in the individual conduct of man with his fellow, thus blending itself with the entire social structure. Again, the effects of a disordered mind, which have just been alluded to, are of even yet graver import, and it is one of the marked advances of the science of the healing art, and one of the indications of its comprehensive scope, that it has taken insanity out from the circle of depravities and placed it among the classes of disease, and its far-reaching influence in this respect upon the mass through the individual cannot be over-estimated.

As an insane person the man is a burden and expense to his friends, often a source of crime, sometimes murder; to society he is also a burden, an expense, and an object of solicitude; and as a factor of crime a formidable element in the courts of the nation. It is appalling to think that such a being as this should be placed in a position of influence among his fellow-men; but suppose a man about whom there lurks even a taint of unsoundness of mind to be in such a place, and society reaps the ill results of caprice, narrow-mindedness, and the workings of an ill-balanced mind. The prevention, then, and cure of insanity, by a due regard for the laws of health, puts money in the public treasury, soundness in the national mind, and in the execution of its laws brings in play well-arranged mental faculties. The effects of these two diseases, insanity and intemperance, acting upon a given person, as is not unfrequently the case, afford a striking analogy to the moral and financial decline of a nation. Here, for instance, is a young and artless boy, a child of healthy parents, but in his early manhood he yields to evil influences and enters upon a course of intemperate habits. What at first was an indulgence soon became a disease which progressed surely toward insanity, and this fair young boy becomes the bloated, bleared inebriate, with a mind beclouded and overthrown. The will power that presided over the young man's actions, too feeble at the outset to resist unaided the pressure from without, gradually yielded till it became also disordered in its actions, and the whole being, having overcome the cohesive power that held it in place, went out into darkness forever. Some incentives impelled him to a high plan of action, some to a low; some, if followed out, would have caused

his whole nature to expand, and would have shed like a fruitful tract a benign influence on all around; his body would have taken on symmetry, his mind have become broad and just in its workings, and his appetites would have become the vehicles of nutrition to his framework.

On the other hand, one perverted and misused appetite, one distorted thought, would lower in a corresponding degree the whole man, and thus he would go on till the spiritual was lost in the sensual, and the animal reigned where once reason held its sway. So in the case of the nation; the same expansive powers would round it out to completeness and spread peace and prosperity throughout its borders. The sun smiles upon it only to vivify it, and the rains cause its verdure to spread around, and both typify externally the healthful state within. But if it yields to the opposite influences, the nation's physical and moral qualities alike suffer; and, like the individual, it sinks into squalor and misery. Beggary is seen on every hand; the filthy cities breed disease; sickness spreads over the land, and death stalks through its borders. So also the modern treatment of insanity and its results, as compared with that formerly employed, illustrates the causes which have produced the rise or downfall of nations. Under this method fully one-half recover, while under the old method of neglect and inattention multitudes perished. Thus, in a growing knowledge on the part of the people of the laws of health we can easily read the signs of national sanity and prosperity, and in a want of it, the reverse. History is full of such illustrations; and I name ancient Greece and Rome as examples of the one, and the Europe of the dark ages as that of the other. Greece had her Celsus, her Socrates, her Solon; and here for a time lived Galen; and here also Hippocrates dwelt and labored. These doubtless were imperfect guides in many respects; but their influence tended to elevate the body, to suppress the passions, to regard the body as a sacred temple, to cultivate the mind in virtue; and however much these precepts were abused by the Spartan youths in excessive physical exercise and the subjection of the body to an undue amount of pain or fatigue, yet this was more than overbalanced by the general observance on the part of the people of healthy living; and the prevailing sentiment of the time may be summed up in these words of Aristotle: "The philosopher should end in medicine, and the physician commence with philosophy"; and much of the grandeur of that ancient civilization here had its rise and growth, which was lost only when the people sank into luxury, effeminacy, and immorality.

Turn now to the Greece of to-day. The individual has lost his sense of responsibility; he cultivates vice; no stern models of virtue point to a higher standard; and the nation has lagged behind the age, has little to boast of in the present, and is only beautiful because nature smiles on her, and the wrecks of a past civilization still exist, the monuments of a lost glory. It was not the sentiments, the æsthetics, that developed the nation. The individual might paint beautiful pictures and cut out marble statuary superbly fine; but these alone were not the highest inspirations to prosperity, but rather in the cultivation of bodily health all arts, all pursuits, were ennobled, and the pictures they painted took on that

happy blending of shade and effect which a healthful organism imparts to all things; beautiful physically and mentally, all the operations of life assumed the same harmonious movement.

The early Romans were temperate, simple in their lives; "laws were enacted to suppress luxury and punish indolence"; the young men did not drink wine until thirty, and it was totally forbidden to women. From a race of shepherds, poor and obscure, they rose to be a powerful nation by their simplicity, and only when intoxicated by success in the pursuit of war did they borrow the luxury and vice of the Asiatics, which proved ere long their ruin; and in speaking of the sanitary condition of Rome to-day, Dr. Draper says: "In 1870, an eye-witness, the author of this book, at the close of the pontifical rule in Rome, found that in walking the ordure-defiled streets of that city, it was more necessary to inspect the earth than to contemplate the heavens to preserve personal purity."

Consider now the people of Europe from the fourth to the sixteenth century.* "In Paris and London no attempt was made at drainage; garbage and rubbish were simply thrown out-of-door; men, women, and children, and domestic animals, lived promiscuously; man's duty and morality sunk to a low ebb; personal cleanliness was not known; to conceal personal impurity perfumes were necessarily used; the citizen clothed himself in leather, which, with its ever-increasing impurity, lasted many years; the streets had no sewers; at night the chamber shutters were opened and slops unceremoniously thrown down to pollute the street. In 1430 the condition of the British peasantry was pitiable in the extreme; they lived in cabins of reeds plastered with mud; wisps of straw were twisted about their limbs to afford the clothing; the ague-stricken peasants had no hope except in shrine cure. In the famine of 1030 human flesh was cooked and sold, and in that of 1258 fifteen thousand persons died of hunger in London. This was the condition of the peasantry; no better was that of the nobles: they were devoted to gluttony and voluptuousness; drinking day and night was the general pursuit; vices, the companions of inebriety, effeminating the manly mind. In those days the death-rate was about one in twenty-three; now, about one in forty." Such is the outline of the picture which Dr. Draper draws; and it is quite enough of itself to illustrate the sad effects of man's misdoings on his own and his country's life.

And now, pursuing the subject still further into the domain of social life, there are some phases of it which in a peculiarly intimate manner emphasize the close and mutual relation betweeen man's personal condition and the growth and prosperity of a people. Man must have sustenance; he has a certain producing power; he will also increase and multiply; and food must be obtained to meet this increase. If he increases beyond the means of subsistence, then poverty ensues, the race deteriorates, sickness prevails, life is shortened, and charity is demanded, and there is forced upon the community a most weighty and perplexing problem for solution. The needs and resources of a single family thus stand in miniature for

* Conflict between Religion and Science.

those of a whole people; and here the question begins, and in the recognition of which political economists have sought to evolve a theory to answer it. Let us see how well they have done it, and what bearing the hygienic condition of the individual has upon it, and whether it does not afford the best solution of the problem when considered in its relation to the nation. Economists have never given it that weight which rightly attaches to it; they have, it is true, assigned it a place, but have treated it as of minor importance. Mr. Malthus, who perhaps devised the first comprehensive theory of population and subsistence, yields it only the place of an accessory, and does not fully realize the breadth and scope of the term; and the same will apply to the modern writers upon the subject. His statement is as follows: "(1) Population is necessarily limited by the means of subsistence. (2) Population invariably increases where the means of subsistence increase, unless prevented by some very powerful and obvious checks. (3) These checks, and the checks which repress the superior power of population, and keep its effects on a line with the means of subsistence, are all resolvable into moral restraint, vice, and misery." And again: "If we be intemperate in eating and drinking, we are disordered; if we indulge in the transports of anger, we seldom fail to commit acts of which we afterwards repent; if we multiply too fast, we die miserably of poverty and contagious diseases."

A very plain and fair statement it is apparently, and if it admits of no modification, settles the question once and for all. Or, to put it a little a more concisely, the only remedies of any weight for a population increased beyond its present means of support are delay of marriage and restraint of increase; and then, if this is not done, a beneficent law of disease steps in and rids society of the pest which afflicts it. Mr. Mill, who may be regarded as a fair representative of the modern school of economists, while admitting the general soundness of Malthus's views, is yet constrained to take broader grounds, and sees a great equalizing and elevating influence in the diffusion of knowledge among the masses, one aspect of which is expressed in these words: "It appears to me impossible but that the increase of intelligence, of education, and of the love of independence among the working classes, must be attended with a corresponding growth of the good sense which manifests itself in provident habits of conduct, and that population will have a gradually diminishing ratio to capital and employment." The rational sentiment then of this question, giving due weight to both statements, and striking a balance between the two, depends upon the practicability of restraining marriage and increase, and the practicability of the substitution of education and intelligence for vice and misery, and their concomitants—disease and death. It is a mistake to compare excessive multiplication of species with over indulgence in eating and drinking, for the result of the latter is inevitable from absolute cause and effect; that of the former may be mitigated or even changed by a new factor, namely, hygienic education.

Marriage and increase can practically be restrained only to a moderate degree; they cannot be checked by legislation in any effective manner, the whole matter must be left to the judgment and

inclination of the parties in interest. Thus simple moral restraint alone will not be sufficient; the people will multiply; vice and misery will follow; disease and death will come; and yet with all these checks society will be no better off. So then the individual should be led to realize that it is both wrong to contract an imprudent marriage, and also to so conduct the life as to entail misery and poverty upon one's self and family. Marriage should always be regulated and restrained by physiological laws; the individual should be fully alive to his personal responsibility and the duty which he owes to the community; and then "let the increase go on," for if the forces of society can be so adjusted as to avoid the possible ill results of such increase, then the world has need of all who can legitimately come into it. It is fallacious to suppose that hygiene cannot do this. If the education of the individual, and so of the nation, in sanitary science can teach them to be prudent, frugal, and moral—can teach them, in connection with other instruction, a wise forethought in the management of their affairs, then the more a family multiplies the better, and the greater will be its influence and the wider will the nation expand, and all its borders will be filled with fruitful fields and happy homes. It is better that a natural law should flow on like a grand water-course, and only be checked and curbed by such restraints as are normal, even as the diversion and utilization of the stream sets in motion a thousand spindles and gives employment to many hands.

Dr. Farr, in a paper before the British Association for the Advancement of Science, at its last meeting, advocated similar views on these grounds: that the birth-rate in England at the present time was 34.92, and the death-rate 22.31 per 1000 of the population; this gave for the unit of life the net rate of increase .01261, which implied that the population would double in 53.3. Sanitary science had reduced the death-rate from many diseases, and was capable of blotting out some forms of zymotic disease, and had thus raised the standard of life, and would regulate in a judicious manner marriage and increase; so there was no fear in the future that population would outstrip the means of subsistence. And in our own country, New England alone never could have filled up the great West; and it would have been better if she could have furnished to it in the past a much larger number of her sons; she never has furnished so many souls that there was not room for them; the old world even cannot fill the demand from her dense populations. New England has found that it pays to help these weak settlers in their infancy with her money; it has not been thrown away, but every dollar given has brought back in a hundred ways a large return. The East aids the West, and the West gives back to her means of subsistence; and not only to her, but to the whole world. And so if it comes to pass that increase of population tends to increase subsistence for the entire world, and that hygiene can properly balance and adjust these forces, then the problem has reached a solution.

Mr. Mill says that "individuals and communities of a low state of intelligence are always improvident." Now let hygiene be introduced as a factor of adjustment between this improvidence on the one hand and increase of population on the other, both as an agent for relieving misery and in a broader sense as a producer of sus-

tenance by elevating the lower classes who are the recipients of aid, thus making them producers as well as consumers, then a large fund of support will be preserved and utilized. Think for a moment of the amount of money devoted every year to charity to relieve poverty and sickness. Religion, virtue, and custom impel those who have means to bestow a portion of them upon society, and in a diversity of ways to this cause, a large part of it is misdirected by cumbrous machinery and want of system, and the misuse of it by those who are its recipients.

Mr. Fawcett states that Dr. Hawksley has estimated that the amount annually given away in charity in London is more than £5,000,000, and that the most of it is bestowed upon the improvident, and exerts a direct tendency to increase poverty; and the abuse of the hospital and free dispensary system in London has become so alarming that the profession of that city have recently bestirred themselves to see what can be done to rectify it.

We in this country are not a whit behind in our generosity, and if complete figures could be obtained they would show a similar result. As an approximation, it may be stated that according to the report of the Commissioners of Public Charities for the City of New York for 1876, "a multitude equal to about one in nine of the total population of the city received charitable aid," and the aggregate cost of sustaining the charitable and correctional institutions under the charge of the Commissioners was $1,150,230.55, while the Police and Judicial departments expended probably five times as much more upon the same class*; and as respects the abuse of the hospital system, a similar condition is known to exist in New York and other large cities. And what does this show? Not that poverty should go unrelieved, but that some means should be devised to make the recipients of charity worthy of the aid which they receive, and that the money which is improperly expended should be saved. Here again does sanitary science step in as an economic force directed to the individual to make him a fit subject for the substantial aid of his fellow men. Without it, charity is like luxuriant nature, which bestows her gifts in wasteful prodigality in a locality where little needed, while in another more deserving she leaves every object bare and forsaken; with it, she is like nature cherished and restrained, all her forces equalized, while every nook and corner are filled with her appropriate beauties. The charitable public may pour their dollars into the social quagmire of drunkenness, filth, and disease, only to have them buried and lost forever in the seething mass, as they will be unless a healthy and sure foundation of personal responsibility and personal deficiency is first established down at the bottom; and you, oh philanthropists, who act upon any other basis are but giving "spoil to the enemy and fuel to the fire."

This is the plan on which the individual reformer has been the most successful; by the couch of the sufferer, in the home of the degraded, she has shed the light of her countenance, and it has filled the depths, has penetrated the soul, has reformed the life; and is it not better that such a soul should go forth to duty in the world than

* See SANITARIAN, November, 1877.

to die as a beast? Let the very dregs of our humanity be searched out, and reform has entered upon a new period of ever increasing fruition to mankind. Toward this end modern charity must tend. Orphan asylums, homes for the aged, societies for mutual aid, yea even societies for the protection of animals, are all converging points on these paths, that in the future will meet in a common end and mutual good of the race, and when perfected in the distance are to be such purifying influences as vice and misery, in their gloomy mission, have never been in the past. Eliminate from society by education the elements of wrong-doing, and humanity will be like some well-trimmed bark sailing out on the sparkling sea from the rotten, dirt-begrimed wharf of an ancient city, to encounter waves and storms to be sure, but destined at last to reach a new port in a western world.

The extension and preservation of the period of life and its economic bearings, which a truer hygienic condition of the individual is to bring about, are worthy of our consideration. A few statistics will make this plain.* Dr. Jarvis has estimated that at the epoch of the Reformation, "the average longevity in Geneva was 21.21; between 1814 and 1833 it was 40.68; as large a number of persons now live to seventy years as lived to forty, three hundred years ago." And at a recent meeting of the Social Science Association of England, Dr. Chadwick in his address summed up what sanitary science has done for England, and what it can do in prolonging the period of human life; how that by copying certain notorious localities in England and America, with all their unsanitary conditions, the death-rate may be made to amount to forty per thousand annually.

On the other hand, an observance of sanitary laws might and had produced the following results:

(1.) We have gained the power of reducing the sickness and death-rate in most old cities by at least one-third; or, as a rule, of reducing the death-rate of old urban British districts to sixteen or seventeen in a thousand.

(2.) In new districts, or sites apart from old urban sites, we may, with a complete artesian system of water supply and surface cleansing, including measures for the prevention of over-crowding, insure reduction of death-rates to less than one-half, or a mean rate of ten in one thousand, and the sickness in like proportion.

(3.) In well-provided and well-regulated institutions for children from three to fifteen years of age we may secure them an immunity from the common children's epidemics, and reduce the death-rate to a mean of about three in one thousand, or to one-third of the death-rates prevalent among the general population of the same ages.

(4.) To the persons in such institutions an immunity may be given against all ordinary epidemics—typhus and eruptive diseases, diarrhœa and dysentery, which ravage the general community.

(5.) Among the general population a reduction of fully one-half the diseases of the respiratory organs may be effected by general public sanitation.

(6.) Complete habits of skin cleanliness, alone and apart from

* See Conflict between Religion and Science, Dr. Draper, page 325.

general structural arrangements, or alterations of habit in other respects, constitute a factor of about one-third of the power of sanitation.

(7.) By a proper selection and due sanitation of sites, in tropical climates, and the sanitary care of the population, the birth-rates may be made to exceed the death-rates, and a healthy succession secured for colonization, for people of the British or white races.

(8.) By the increased health and strength by improved physical training under sanitary conditions, on the half-school-time principle, in the juvenile and primitive stages, the efficiency of three for productive occupations may be imparted to every two of the more depressed classes of the population.

(9.) The death-ratio for disease of the mercantile marine may, by the exercise of like powers of sanitation that are exercised in the Royal Navy, be reduced by two-thirds, or to the general death-rate now prevalent in the Royal Navy, namely, about six in one thousand.

(10.) As indicated by existing normals, the greatly reduced death-rates in the army at home and abroad, admit of important further reduction by a more complete application of true and approved means of sanitation.*

There is something grand in the contemplation of these results, and that there is steadily and increasingly going on in the community a force which is pushing further and still further the duration of human life toward its natural limits, and is building up where carried out an enduring capital for the nation. Its progress may be likened to the growth of knowledge on the part of a people in some material art, like that of printing; or the permeation of some great principle among the masses, as that of the love of truth or freedom. How does it blend and mingle with the whole structure of social and domestic life. It preserves the life of a child, and so adds strength to the father's life; it spares a mother to her growing children, when her death would be the overthrow of the whole family circle. And the old and oft-repeated expression heard, when the head of a family is taken, "What a loss!" has a deeper significance than is usually attributed to it; for it is but the recognition, unwittingly though it be, of the close and vital relationship between the individual, socially and economically, with his family and the community at large. The preservation of one life is the storing up of so much force which is to be utilized in the upbuilding of society; to be set free, not as the whirlwind is let loose in nature, nor like the mad revolution of a socialistic mob, but as the food is stored up in the growing plant by the vivifying influences of the sunlight, to be set free and utilized in man's physical support.

The end of educating the people in sanitary matters is to be accomplished in a large measure in the public schools. Hygiene should be made a part of the regular course of study, and its outlines should be inculcated in the youthful mind from the outset. Such instruction would have a somewhat parallel effect as that which the teaching of music has wrought wherever it has been done. There a race of

* *British Medical Journal*, September 29th, 1877; also, see recent numbers of THE SANITARIAN.

singers has sprung up, and all the rising generation know the outlines of music, and can put them in practical use, as they actually do on suitable occasions. If it is so readily practicable to infuse a musical spirit into the community, it will be correspondingly feasible, if a little more difficult, to spread abroad a fair appreciation of the principles of hygiene. The public-school system is the pride of our nation because of its elevating power upon the individual. Its scope should not be confined simply to his development in mental knowledge; but, in addition, should teach him the laws of his own body, its functions and responsibilities, both to himself and to the community. And if it is the reasonable hope of the best minds of the age that the day will come when the differences of the nations will be settled by the arbitrament of peace instead of the conflict of war, then it is also reasonable to hope that the time will also come when disease will not be overcome as an armed and mailed foe, but will be circumvented and thwarted ere it has gained a foothold by man's superior knowledge of himself. It is for us, as Americans, the home of progress and free institutions, whose broad untilled acres stretch far westward and southward, as well the latter but just redeemed from the thraldom of a bitter past, all of which stand ready for the benign influences of honest toil, and toward which the unemployed thousands of the old world turn with eager eyes to carry out these just expectations. We love our material prosperity, but we love humanity as well, and when we learn to seek the welfare of both by educating the individual to a proper knowledge of himself and of his responsibility to himself and his country, then indeed we shall have entered upon an era of reform that shall endure.

"Nil desperandum!" O, never despair!
While the smoke of the battle becloudeth the air,
For the victory's oft won at a life's given cost,
Though in the fierce conflict 'twere seemingly lost.
Hope on forever! O, never despair!
While the frost of the winter is chilling the air,
For the spring bringeth buds, which were seemingly dead;
They bloom into life 'neath her fairy-like tread.
If tempted to falter! O, never despair!
Though the night be so dark, while the sunset was fair,
For the morning will dawn with a roseate light,
And joyously scatter the shadows of night.
Gather up courage! O, never despair!
While there's breath, let us take in the life-giving air,
Though the pulse may be sinking, it oft hath run high,
While the angel of death was still hovering nigh.
Never despair! O, never despair!
Though we faint in the race, for it endeth not there,
Our Saviour once sank 'neath the weight of the Cross,
Yet the blood-stains of Calvary betoken no loss.
Though after we sink 'neath the burden of care,
And Hope, cheated oft, seems to gasp in despair,
Let "*nil desperandum*," our motto through life,
Be inscribed on our tomb when hath ended the strife.

—Mrs. E. O. Donnelly, in *The Baltimorean.*

THE ENEMY IN THE AIR.

The following comes to us, with a familiar signature, through the *Messenger*, an enterprising missionary paper of Staten Island. Truths so wholesome are eminently worthy of the most energetic missionary spirit, and it affords us much pleasure to aid in their propagation:

It may sound like a "sensational" proposition to assert that half the readers of the *Messenger* are living in houses which, under a rigorous system of sanitary supervision, would be unhesitatingly condemned as unfit for human habitation; but if we take into account, not alone the death-rate, but the multitude of minor maladies due to faults of household construction, this startling statement probably falls short of the truth. Setting aside the somewhat exaggerated aspersions cast upon Staten Island by dwellers in glass houses in Astoria, Westchester County, and New Jersey, as regards malarial emanations from the outer soil (which, by the way, might be averted by expending upon drainage about half the sum yearly spent in doctors' fees and patent medicines for "chills"), the diabolical ingenuity of landlords, builders, and plumbers has been effectively exercised in providing numerous occult devices for poisoning the interior atmosphere of our domiciles; and this in addition to the fact that every tenant is automatically competent to pollute his own aerial environment to the utmost limit of ordinary ventilation, exhaling enough carbonic acid and volatilized organic matter to vitiate about three thousand cubic feet of air an hour.

The enemies stealthily admitted into our homes are chiefly the vaporous products of decomposition, or, as scientific phraseology hath it, "organic matter in a state of change"; and although these gases, being rapidly diffusible, are comparatively harmless if allowed to escape into the outer atmosphere as fast as they are generated, they are inevitably noxious when brought into the inclosed air of an inhabited apartment. Whatever diversity of opinion may exist as to the contagiousness of diphtheria after its outbreak, there is no doubt of the origination of this dreaded disease from "excremental pollution of respired air"; typhoid fever too is often unquestionably traceable to "sewer poisoning"; cerebro-spinal meningitis is statistically connected with defective house drainage; it has even been mooted among epidemiologists whether scarlet fever may not be generated anew by blood-poisoning from such sources. Apart from these graver manifestations, however, there is an almost infinite variety of obscurer disturbances of health which too many good people are apt resignedly to attribute to the will of Providence, instead of searching for their remediable material causes. Habitual headaches; derangements of the digestive organs; enfeebled appetite and nausea; frequent transient feverish attacks; a general condition of malaise and pallid invalidism: these are common results of the deterioration of the blood by constant respiration of contaminated air, which, furthermore, through its effect in lowering vitality, is

potent in predisposing to acute inflammatory diseases, and in developing such constitutional taints as scrofula and consumption.

To keep poisonous gases out of our houses we must first inquire how they get in, and for this purpose an early inspection of the cellar may be instructive. Few readers, perhaps—few builders, certes—are aware of the existence and perpetual circulation of an underground atmosphere; yet the most compact soil is porous enough to contain, above the level of the sub-soil water, a surprising quantity of air. This can be shown by the simple experiment of filling a bucket with earth, and then seeing how much water may be poured into it without overflowing; the water, of course, finding room only by displacing the air which the earth previously held. Now, if our cellar be not air-tight as to its floor and foundation walls, the heated atmosphere of the house, creating an upward draught, sucks in beneath, converging currents from the surrounding soil; and where, as often happens, this soil is sodden with putrescent organic matter, such incoming currents bring with them a dangerous freight of foul vapor. Not only are most cellars left pervious to this influx, but, to aggravate the risk, in far too many instances furnaces are so arranged as to propel the cellar air, with all its imperfections on its head, directly into the upper part of the house. Even if a cellar be properly cemented, it usually contains vegetable matter and rubbish enough to render it an undesirable source from whence to derive one's breathing supply, and under no circumstances should a furnace be tolerated which does not draw in pure air from the outer atmosphere.

But vastly greater perils do environ those whose habitations are garnished with what builders and real-estate agents are pleased in unconscious sarcasm to term "modern improvements," meaning thereby an elaborate system of pipes to afford ingress for gases from a receptacle admirably calculated to generate them on the most extensive and mischievous scale. A sewer is bad enough, in all conscience, unless it be amply flushed and thoroughly ventilated; but a cesspool is a thousand times worse as a semi-detached appendage to one's bedroom. The sanitarian's maxim in dealing with organic refuse is, like the London policeman's watchword, "Keep moving"; you, respected sir, or madame, as the case may be, take pains on the contrary to store such refuse close to your doors in a pit constructed to furnish it with the warmth and moisture most favorable for decomposition. This pit you have hermetically closed (unless it occur to your builder to connect it by means of an "overflow pipe" with your cistern in order to contaminate your drinking water), and having thus provided against the escape of any vapors externally, where they would do least harm, you engage a "practical plumber" to adopt measures for admitting them indoors. After awhile, the accumulating gases in the cesspool reach the limit of their elasticity, and exert a constantly increasing pressure upon the plumber's "siphon traps" (which deserve their name, inasmuch as the siphon action often leaves them empty), finally gaining sufficient strength to force their exit through any ordinary "water seal." When this limit of compressibility is attained, it is moreover evident that every cubic foot of water thrown into the cesspool must displace a cubic foot of the condensed "sewer gases," which, regurgitating as they often audibly do, re-expand to a manifold greater volume

when relieved from restraint. Nor is this all, for such is the corroding chemical action of these gases that a leaden waste-pipe exposed to their influence will be eaten through in a time averaging less than twelve years, and an iron pipe will not endure for a very much longer period.

To obviate this pestiferous pressure, your plumber may perhaps advise ventilation of the waste-pipe within the house by carrying a vent tube from it, either into an adjoining chimney flue, or above the roof. In the former case it is to be borne in mind that a chimney not constantly heated is apt to convey a descending current of air, bearing your sewer gas down into the room; in the latter case, even if the up-vent perform all that is expected from it, it is open to the objection that it creates an inward draught from the cesspool, which is far from desirable if there be defective traps or perforated pipes intervening. All hygienists of repute agree that the only effective safeguard against the ingress of vaporous foes of this sort lies in the absolute disconnection of the house-pipes from the cesspool or sewer by interposing, outside of the house walls, a ventilating trap which shall intercept and dismiss into the outer atmosphere all regurgitating gas. Of such traps several different patterns have long been favorably known abroad; none of them, however, more perfect in their working than that recently introduced by the Messrs. Stewart here. With one of these simple appliances out-of-doors, a cellar tight and dry, and indoor drain pipes without material leakage, domestic life would be secure from the worst of its invaders. What other morbid influences beset it may be worth deseribing in a future communication. A. L. C.

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The Nutritive Value of Milk, as calculated from its elements, is very large, and its price is low, as compared with meat. According to the Kensington Museum Catalogue, one pound of milk can produce at the maximum .8 ounce of dry muscle or flesh, and if digested and oxidized in the body, is capable of producing a force equal to 390 tons raised one foot high. One pound of lean beef is reckoned as a force producer as 990 foot tons. Calculating the dry muscle as moist flesh, 25 pounds of milk are equal to 4 pounds of lean beef in nutritive value, or in other words, 1 pound of beef is equal in nutritive value to 2.9 quarts of milk. Now, when milk is 7 cents a quart, it is cheaper than beef at 21 cents a pound. We are led to these remarks by being reminded of the small consumption of milk by an ordinary population. From the best authority it is stated that but 2-5 of a pint a day are used in the asylums, schools, etc., in England; 2-7 of a pint a day in one town, Sterlin; and but 1-5 of a pint a day in the English towns of Mansfield and Bedford. According to Dr. Edward Smith, the following table represents the consumption in the given place for each adult:

In England	32 oz. weekly.
Scotland	125 oz. "
Wales	85 oz. "
Ireland	135 oz. "

In 1868, when Waushakum Farm furnished the village of South Framingham with its principal supply of milk, the average daily delivery was 1 pint to a family. Allowing 5 to a family, this would be about 1-5 of a pint to each soul of the population daily.

THE POWERS OF SANITATION AVAILABLE FOR THE COLONIAL AND INDIAN CITIES OF GREAT BRITAIN; AND THE CHIEF RESULTS OF THE PROGRESS OF SANITATION UNDER VARIOUS CONDITIONS AND CLIMATES.

By Edwin Chadwick, C.B., President of the Health Section.*

The principles so tried, examined, and sanctioned, will be found by competent authorities to be peculiarly adapted for the sanitation of colonial, and especially for Indian, cities. A lady traveller stated that in travelling through India she knew at night that they had come to an Indian city from being awakened by its stink. This fact would denote to the sanitary scientist that she was awakened by the waste of manure—the horrible waste by evaporation of the finest elements of vegetable production for the sustentation of a famine and fever scourged population. You may now test a condition of civilization of a legislature, and of an administration, central as well as local, by the smell. On such experience as I have cited the waste of manure in famine-stricken Madras would suffice to sustain some 20,000 head of cattle, and the equivalent of food for the population; and double that in Bombay. A friend, an engineer officer, Capt. Baird Smith, when he was at home on leave, asked my advice, for the occupation of his time in professional study for use in India. I advised that he could not do better than study the irrigation works of Northern Italy. He did so, and published a book about it for his brother engineer officers in 1852. Sir Arthur Cotton had long demonstrated, to an extent of which I was unaware, the policy and profit of irrigation works. If that policy had been pursued, and if we had given the people water (even plain water), we should not now have to be giving them bread. Of late, however, instead of carefully collecting and carrying to the East the latest improvements in science, and especially this new science, as I may call it, the new power of giving to plants food and water, and also at the same time relieving cities of the causes of depression, sanitary engineers have been carrying to the East the oldest and most expensive errors of the West. As an example. A local plan for the drainage of Cawnpore was referred to me for my observations, from the Works Department of the Indian Government. I found it to be a plan mainly for the construction of sewers of enormous size to receive and carry away extraordinary quantities of storm water, which might well have gone direct to the river, whilst the expense would have sufficed for the proper drainage of the houses. On this scheme I wrote a paper expository of our tried and proved principles of water carriage as

* British Social Science Association, Aberdeen, September 13th, 1877: Address on Health. Concluded from page 232.

applicable to Indian cities. The Duke of Argyll approved of this exposition, and directed the attention of the Governor-General and of the local officers of works to it. The objection those officers raised to it was mainly that the system of water carriage was incompatible with the habits of the natives. This is the same objection that was at first raised to the system of water carriage here. Local authorities, vestrymen, generally small landlords, who from an ignorant dislike of the expense of altering their tenements, insisted that a water-closet was utterly unsuited to the habits of the people; and that the tub system of removal, which required no immediate outlay to them (the landlords), and the working expenses of which were to be paid out of the rate, was the proper practical system. We set aside these ignorant and selfish pretexts, and water-closets have now been brought into systematic use for masses of the population, comprising classes as low as the lowest of any of the most barbarous classes in Indian cities, and in a very little time it is found to be satisfactory in its working, and the objections as baseless here, as under good rule they will be proved to be in the Indian cities. The expense of the bad, imperfect system of removal in the tub system in Bombay, even by the cheapest Indian labor, appears to be double the expense of water carriage in England. I grant that a daily removal by the tub system is better than removal to sewers of deposit. If, however, it passes the skill of the unsanitary engineers to construct no other than extended cesspools, let them, for the safety of life, give place to competent specialists. But the first advance in sanitation by water carriage may be in relation to the economy and application of the manure of the Indian cities, where the waste, by burning and throwing it into streams, is enormous and most reprehensible. Even the solid animal matters may be made to feed edible plants, instead of dogs and vultures. The introduction of liquefied manure farms, to receive and apply at once the excreta of cities, would have the peculiar advantage for India as serving as great trial works, for the instruction of the people in new cultures, in the introduction of new foods, and relieving them from the lazy, dangerous, and total dependence on one. The irrigation with the liquefied manures of cities would moreover have the great advantage, as a culture, of the freedom, experienced here, from the irregularities of rainfall and from droughts, by storage of water reservoirs and the works for ensuring the regularity of the supply of water to the populations of the cities. In some districts of India, as I am informed, the natives have great skill in irrigation, in water leading with plain water, by methods, some of which might be copied at home for leading liquefied manure. It may be mentioned, as illustrative of the working of the pernicious working of the population check, and of the beneficent counter principle of saving life instead of destroying it, that the great obstacle to the progress of the new cultures we are meritoriously introducing into India of coffee, tea, and others, is the want of hands, and yet they die of hunger by thousands!

On the general question of the sanitation of Indian cities, it is to be admitted that, according to the descriptions given of some of them, they are so hopelessly bad in the sites and in the surrounding areas, amidst extensive marshes, and in the construction of the houses that the cheapest course will be one of removal and of reconstruc-

tion. When the powers of sanitation, as recited, become known and understood, the like course will be taken with old Western cities. We may, indeed, be said to be beginning already in the like course with bits and blocks of our old towns. But if we are to hold India, it may be submitted that it should be for the Indians, and for their protection against pestilences, as may well be done by utilizing trained, working military force. In that policy we should keep in view the important example I have cited from Algeria. The Indian military service of the scientific corps have, it is due to mention, afforded instances of great administrators, but little known here, whose achievements not being of battle or of bloodshed, of "Siva the Destroyer," but of "Vishnu the Preserver," are ungazetted, but who have shown in how short a time the conditions of populations may be beneficially transformed, and who have been positively deified by the poor natives who came under their rule. Let me mention one who, if he had the special light of sanitary science, would have done his work probably even more completely than he did. Major Dixon, of the Bengal Artillery, was sent with a brigade or force to keep in check a robber tribe in the Mairwarra, a hill district about as large as the Highlands of Scotland. He found that from the want of water and the failure of crops they were obliged to make forays on the lowlands for subsistence. He raised capital, made storage-reservoirs, cleared jungles, founded one hundred and thirty villages, and so engaged that population in productive occupation that they could not afford to rob. To dispose of the produce raised it was necessary to have a market and to found a town, and we may be sure that neither town nor villages were fever nests. Instead of spending a revenue, he raised a revenue from that non-productive population; instead of occupying a brigade of force with it, he raised a brigade of force from it, and that brigade was loyal to us at the Mutiny, before which, having completed his good work, he unfortunately died. India has now an incipient sanitary organization, comprising able officers who have already rendered good services discovering and displaying the sources of epidemics, and correcting pernicious home errors, as to their rise and spread and the means of their prevention. It would follow that the present declared and accepted policy of the Premier, that the health of the people is the first object of good government, surely that policy should have commensurate application for the protection of our most afflicted and depressed fellow-subjects of the Indian Empire, that they should be rescued from the ravages of the destroyer, and be made to feel that in being brought under the sway of their Empress, our Queen, they are brought under the sway of the preserver.

I beg now to submit a summary of the chief results obtained of the progress of the power of sanitation, deducible from the normal instances I have adduced, or of which, from want of space, I have been obliged to content myself with giving indications for examination:

1. That we have gained the power of reducing the sickness and death-rates in most old cities by at least one-third; or, as a rule, of reducing the death-rates in old British urban districts to 16 or 17 in 1,000.

2. That in new districts, on sites apart from old urban sites, we may, with a complete arterial system of water supply and surface-cleansing—including measures for the prevention of overcrowding—ensure reduction of death-rates to less than one-half, or to a mean rate of 10 in 1,000, and the sickness in like proportion.

3. That in well-provided and well-regulated institutions for children from 3 to 15 years of age we may secure them an immunity from the common children's epidemics and reduce the death-rates to a mean of about 3 in 1,000, or to less by two-thirds of the death-rates prevalent amongst children of those ages in the general population.

4. That in prisons and places under effective sanitary control the death-rates (from disease) have been reduced amongst persons from the school ages and upwards to about 3 in 1,000, or to one-third of the death-rates prevalent amongst the general population of the same ages.

5. That to the persons in such institutions an immunity may be given as against all ordinary epidemics, typhus and the eruptive diseases, diarrhœa and dysentery, which ravage the general population.

6. That amongst the general population a reduction by full one half of the diseases of the respiratory organs may be effected by general public sanitation.

7. That complete habits of skin cleanliness, alone and apart from general structural arrangements, or alterations of habits in other respects, constitute a factor of about one-third of the power of sanitation.

8. That, by a proper selection and a due sanitation of sites in tropical climates, and the sanitary care of the population, the birth-rates may be made to exceed the death-rates, and a healthy succession, for colonization, for people of the British or of the white races.

9. That by the increased health and strength imparted by improved physical training under sanitary conditions, on the half-school-time principle, in the infantile and juvenile stages, the efficiency of three for productive occupation may be imparted to every two of the most depressed classes of the population.

10. That the death-rates from disease in the mercantile marine may, by the exercise of the like powers of sanitation that are exercised in the Royal Navy, be reduced by two-thirds, or to the general death-rate now prevalent in the Royal Navy, namely, of about six in one thousand.

11. That—as indicated by existing normas—the greatly reduced death-rates in the army at home and abroad, admit of important further reductions, by a more complete application of tried and approved means of sanitation.

12. That by efficient sanitation, the transit of persons from infected places may be most safely effected, and the freedom of trade, including the transit of goods, may be relieved from the obstructions and expensive and vexatious delays of quarantines.

13. That the venous and arterial system for the sanitation of cities is fully demonstrated by varied increasing practice.

That all this may be done admits of more abundant proof than in

this address I have been able to adduce on the present occasion; that all this has been done under conditions that admit of more complete and efficient repetition. On the whole, it will be found to justify the recent most important declaration of the Prime Minister to a greater extent than he has had time or opportunity to be made aware of. I cannot do better than repeat here the terms in which the declaration was made, the highest that has yet come from the head of any government:—"I have touched upon the health of the people, and I know there are many who look upon that as an amiable, but merely philanthropic subject to dwell upon; but the truth is that the question is much deeper than it appears upon the surface. The health of the people is really the foundation upon which all their happiness and all their power as a State depend. It is quite possible for a kingdom to be inhabited by an able, active population; you may have skillful manufacturers, and you may have a productive agriculture; the arts may flourish, architecture may cover your lands with temples and palaces; you may have even material power to defend and support all these acquisitions; you may have arms of precision and fleets of fish torpedoes, but if the population of that country is stationary or yearly diminishes; if, while it diminishes in number, it diminishes also in stature and strength, that country is ultimately doomed. And, speaking to those who, I hope, are not ashamed to say that they are proud of the empire to which they belong, and which their ancestors created, I recommend to them by all the means in their power to assist the movement that is now prevalent in the country for improving the condition of the people by ameliorating the dwellings in which they live. The health of the people is, in my opinion, therefore, the first duty of a statesman."*

From what is known I may venture to express a belief that this declaration is in perfect accordance with the deepest feelings and wishes of Her Majesty the Queen.

Sanitary science has had for its first stage simple ignorance and apathy, to which the Premier adverts; next, its stage of empiricism and half-knowledge, in which stage it is very much at present; with the common result of expensive, misfitting, inefficient, and wasteful works, with water distributions which make good supplies bad, and bad supplies worse; with water carried into houses without the means of removing fouled and waste water, aggravating the evils of damp and of excrement-sodden sites—sewers without adjustment to the house drains, intended arteries without relation to the capillaries of the system, leaving undiminished death-rates, serving to encourage the sinister objections that sanitation is of no avail—and lastly, it has the stage of science, of complete knowledge, of unity, efficiency, and economy, tested by reduced death-rates. On these stages I might further dilate. Corresponding with these stages of works are stages of empirical and hasty legislation, of defective administrative organization, which require distinct exposition as a cause of disaster and waste of money, without equivalent results;—and next we must look to more advanced,

* Opening of the new buildings of the Victoria Dwellings Association, June 23d, 1877.

scientific, and efficient legislation—the outcome due from that study of the means of protecting the health of the people which the Premier has repeatedly declared to be the first duty of a statesman. This of legislation is a topic of large and distinct consideration. I have confined myself to the exposition of the established normas of sanitary power, which are available for an advanced legislation and administration to apply. In the support of that advanced legislation we have new agencies for the formation and guidance of an advanced public opinion. In alliance with our association we have the British Medical Association, with an effective joint committee, specially directed to the consideration of the improvement of the local and central organization of the public health service. Besides these we have new and zealous voluntary associations established in the metropolis and in the course of formation in the provincial cities. We have, moreover, new journals ably and earnestly devoted to the advancement of the public health. The like governmental organizations and voluntary associations are in course of formation and advancement in the United States, in France, Belgium, and Germany. It will be my consolation and reward if the normal examples I have adduced shall serve to give increased confidence and encouragement to our fellow-laborers for the reduction of the greatest afflictions of our fellow-creatures.

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Diet.—Elder J. S. Prescott calls our attention to an experiment in dieting, which a person in Medina, Ohio, has practised with increasingly beneficial effects. As an economical experiment it certainly is forcibly interesting. We condense: "For breakfast, five graham gems with butter; no inconvenience or hunger followed—cost *three cents.* Dinner ¼ lb. rice, one ounce each of sugar and butter—a good meal—cost *five cents.* Supper, ¼ lb. corn meal, ½ pint milk, cost *three cents.* One day's cost 11 cents. For a change, one gill of beans, which, by the quart, cost less than half a cent."

The correspondent claims to have worked hard, ate nothing between meals, is renewing his age and youthfulness, and only dreads the lonesomeness to be experienced by living to a very great age. —*N. Y. Shaker.*

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Rice is of more use and of larger cultivation than any other cereal grown. It is almost the only diet of hundreds of millions of people in China, Asia, and all Eastern countries. In those countries it is used the same as potatoes, and is a substitute for them. Only at the North is rice looked upon as a luxury, to be used with milk and sugar. At the present low price of domestic rice, it is the cheapest food obtainable, not excepting potatoes. Potatoes contain about 80 per cent. of water, and do not gain much in the process of cooking. Rice has no waste whatever, contains only 22 per cent. of water, and in boiling gains three times its original bulk. Hence one pound of rice at 6½c. per pound makes three times as much when cooked; equal to three pounds of potatoes at 2½c. per pound or 7½c. Rice properly prepared should come upon the table dry, each grain unbroken, and served with the condiments used on potatoes; and be partaken of as a vegetable, with meats, and not as a dessert.

BROOKLYN AND HER BOARD OF HEALTH.

Report of the Board, 1875–1876.

Brooklyn, with a population of nearly 530,000, ranks as the third city on this continent; and in point of numbers is about the tenth city in the world. Its great commercial importance may be inferred from the fact that, during the four years from 1873 to 1876 inclusive, there were 14,772 permits issued to discharge cargoes at her docks, while in New York the number granted during the same period was 14,412, showing an excess in favor of Brooklyn of 360 cargoes.

That the sanitary interests of a great city like this should be placed under the control of politicians who are profoundly ignorant of the duties they assume to perform, shows the utter indifference of the people to the manner in which public affairs are managed, and the facility with which Albany legislators can be manipulated by interested parties. Nor is it surprising that such Boards, acting in their own interest or in the interest of their friends, should not make haste to publish an account of their official acts. For this reason, probably, Brooklyn has thus far published but two reports. Previous to 1866 the sanitary interests of the city were in the hands of a Committee of the Common Council, and only such measures were taken to preserve the health of a large and rapidly growing city as in Europe are intrusted to the sanitary police. From 1866 to 1870 New York took care of the health of Brooklyn. Why? Probably because New York politicians were then all-powerful at Albany. In 1870 the administration of the sanitary affairs of the city reverted to a Committee of the Board of Aldermen, with a physician as its nominal head. In 1873 an act to establish a Board of Health, to consist of medical men, after the plan of the Metropolitan Board, was passed, and in 1874 another act was passed giving the control of the Board to the politicians. What rare good sense and stability of character we find in the men at Albany who make our laws!

In January, 1875, the Board then in existence prepared a report of their official acts, extending from May 8th, 1873, to January 1st, 1875. This was the first Brooklyn report, and was published about a year later by the Board that succeeded it, and seems to have had a very limited distribution—few copies can be found. On the 21st of June, 1875, the Legislature passed another act removing the Board then in existence, and creating the Board whose report has lately been published. The present report tells us that "on the 28th of June, 1875, his Honor Mayor Hunter nominated Andrew Otterson, M.D., for President of the Board; and the nomination being confirmed, on the first day of July ensuing, Doctor Otterson took his seat with the other members of the Board." Thus it will be seen that while the medical element of the preceding Board was removed, the politicians retained their places. "This report," we

are told," embodies a brief record of the work of the Department for the term ending May 1st, 1877, with vital statistics for the years 1875 and 1876."

Thus the report, beginning May 1st, 1875, ignores completely the official acts of the Health Department from January 1st to May 1st, 1875, except the tables from the office of the Registrar, which could not be mutilated without destroying their value.

This is, indeed, a remarkable report: remarkable because there is not a page in it that bears any trace of the ready pen of the President, the only medical man in the Board, if we except the page that contains his report on Cremation; remarkable because we find three commissioners having charge of the health of the city affixing their signatures to a document to which none of them, probably, contributed a line; and remarkable for the contradictory statements to be found on every page. A very noticeable feature, running through the whole report, is a covert attack on the efficiency of the Board that preceded it; and, indeed, we may regard it as a *criticism* of the measures of all preceding Boards and a *defence* of its own. Thus in speaking of the Charter of 1873, and the Board organized under it, the report says: "The powers and duties of this Board were of an arbitrary and yet unknown character." If the powers of the Board were of an unknown character, how were they known to be arbitrary? Again: "In addition to this confusing mass of statutory provisions, there were also still in existence and still operative many of the sanitary ordinances of the old Metropolitan Board of Health." On page 37 we are told that "former Boards of Health had found it impossible to make Mr. Ehlers comply with the sanitary code." Inspector Otterson, in a special report upon this cow-stable, recommends that "a commission be appointed, having a veterinary surgeon upon it, which shall examine into the condition of these animals." In speaking of the Fourth-avenue and Douglass street pond, the report informs us that "a number of persons had lost their lives in its slimy depths (!), and it had been the cause of scores of complaints from the residents of South Brooklyn, and the *bête noir*," whatever that may be, "of Health Boards for years." This nuisance was partially removed; for a notice of its removal, consult the editorial (page 283) of THE SANITARIAN for June, 1876. Why was it removed? Because "on receiving the authority of his Honor the Mayor to make the necessary expenditure, as provided by the charter in cases of *emergency*, the Board proceeded with the work as rapidly as possible." Again: "The entire work cost the city the remarkably small sum of one thousand dollars." If a Board wishes to establish the reputation of being efficient by spending thousands of dollars of public money for abating nuisances and improving *private* property at the same time, it will be easy to make such a reputation if the Mayor grants the money. On page 17 the report makes us acquainted with some of the difficulties encountered: "the Board has found its greatest difficulty in enforcing its orders for the abatement of nuisances upon property belonging to non-residents." And on page 23: "It was hoped that the attention of the authorities would be awakened to the importance of this matter, and that the construction of a sewer"—a continuation of the Union avenue sewer—"as recommended, might be effected in time to abate

the nuisance before the heats of summer should make it still more dangerous to the public health." It is plain, then, that whenever the statement of the case can be represented as against the efficiency of the preceding Board, it was the *bête noir;* but when it might seem to be against the incumbents, "it was hoped that the attention of the authorities would be awakened to the importance of the matter."

The powers of the Board are set forth on page 15: "The Board has also power to act as a legislative body upon all matters pertaining to the public health, or to the registration of vital statistics; also to enforce obedience to its orders likewise by criminal prosecution; and it may thus take cognizance of any nuisance or matter dangerous to health, the abatement of which may not have been provided for in the sanitary code." Of course "the powers and duties of this Board were (not) of an arbitrary and yet unknown character." "If an inspection shows that an order has not been complied with . . . a warrant is therefore issued, and the delinquent taken into court and turned over to the tender mercies of the judge." Of course the delinquent never has any friends at court, and the judge is *very tender.* "The code is exceedingly broad in its requirements, and a violation of duty of its provisions" —whatever that may mean—"is made a misdemeanor punishable by fine or imprisonment, or both." These extracts, placed beside the criticism of the preceding Board, need no comment.

This Board, in point of fact, differed very little in the plan of its construction from the one that immediately preceded it: "By the terms of this act the Board of Health is composed of a physician, to be appointed by the Mayor, by and with the consent of the Common Council, who shall be President of the Board and of the Department; the President of the Board of Aldermen, and the President of the Board of Police and Excise." The preceding Board consisted of two physicians and three politicians; the Board we are now considering, of one physician and two politicians; and this was the most important feature of the change; and they took care that the "new code should be clear, specific, and ample in its scope for the proper and efficient supervision and control of the sanitary affairs of the city." In order to carry out the provisions of this code, and acting in the interest of economy, as we may suppose, "The office of Sanitary Superintendent, as the head of a distinct bureau of the department, was abolished, and the duties formerly discharged by that officer were assumed by the President, assisted by the Secretary. The President, and in his absence the *Secretary*, is the *chief executive officer* of the department, empowered to exercise the functions of the Board during its (his?) absence, and to enforce the sanitary ordinances or direct prosecution in the courts for their violation." Thus, during the absence of the President, so called, the Board was managed exclusively by the politicians; and this was really the important feature brought about by the amendment to the charter on June 28th, 1875. We are not informed whether or not the Secretary presided at the meetings of the Board; probably a sense of self-respect restrained the *other members* from transferring him from the desk of the Secretary to the presidential chair. Furthermore we are told that "this office also"—the registration of vital statistics

—"is under the immediate control and direction of the chief executive of the department." The politicians, then, had the entire Board under their control, governing its financial, legal, medical, and sanitary affairs, even deciding questions of doubtful nasology.

Bushwick Creek, on the bed of which the contents of the Union avenue sewer were discharged, seems to have been the *bête noir*, as they call it, of the Board, at least it was one of them. The Report tells us that "several communications upon this subject were sent to the Common Council in 1875. Again, in January, 1876, the matter was fully laid before the Aldermen." "This Board recommends that the sewer be continued to the bulkhead line, as by this means the offensive material will be discharged into the East River, and a dangerous nuisance abated." They hoped that the nuisance would be abated before the heats of summer should make it still more dangerous to the public health. The nuisance was not abated, "and the Board deemed it its duty to again call the attention of the Common Council to the necessity for speedy action; which it did, August 1st, as follows" [Then follows a garbled statement containing facts and figures extracted, with slight alterations, from the report of the preceding Board]. This communication was sent to the Common Council over the signature of the Secretary of the Board, and, at the time, had a wide circulation through the press as original matter, and is now in part republished as a part of this report. It appears then that the Board, strong as it might be politically, did not possess the magic wand that opens the city treasury at will. The Common Council did not see any danger to the public health from a hundred thousand tons of sewage left annually on the flats between the Fourteenth and Seventeenth Wards, not even though it contained twenty thousand tons of excrement and urine. There was no money in the treasury for such purposes. Parks, boulevards, and the improvement on the beach at Coney Island were more necessary. The poor in the Fourteenth, Fifteenth, and Seventeenth Wards may sicken and die because the aldermen thought proper to collect a nuisance and place it directly in their midst. No matter if they get sick from inhaling the poison, they may take a drive to Coney Island and amuse themselves on the *Concourse*. But the dangers rising from this nuisance deliberately created by the city, not perhaps with murderous intent, was fully presented in the report of the preceding Board. On page 84 it was said that "Ziureck has made an estimate of the amount of animal waste produced daily in the city of Berlin, containing 700,000 inhabitants."*

The first Report continues: "The figures for the city of Brooklyn, annually, would be, *of excrement*, 16,060 *tons; urine*, 160,000 *tons; liquid garbage*, 985,500 *tons*." This calculation was made on an estimated population of 450,000. The present Report estimates that the Union avenue sewer receives the waste from 50,000 people, and continues: "Careful investigation has demonstrated the quantity of animal waste in cities per capita, and from this an estimate can be made of the amount flowing through this sewer from the population residing in the district drained. This estimate will show

*Die Brunnenwässer, Wässerläufe und Bodenverhältnisse Berlins von O. Ziureck. Berlin: 1869, p. 26.

a *yearly waste of about* 1,600 *tons of excrement*, 16,000 *tons of urine, and* 88,000 *tons of liquid garbage.*"* The estimate assumed 50,000 to be ten per cent. of 450,000, the probable population of Brooklyn at the time the first Report was made.

Slaughter-houses.—We quote from the first Report, page 31: "December 10th, 1874, an additional section was adopted, placing the date for the removal of the business of slaughtering to abattoirs located on the water front, at January 1st, 1876." The slaughter-houses are located in two centres, on Johnson avenue plank-road, about three blocks from Bushwick avenue, and on Hudson avenue, between Concord and Tillary streets. The present Report says: "The supervision of this business, and a consideration of the question whether it should be allowed to continue within the city limits or not, have occupied much of the time of the present Board, as it has also of *former Boards of Health.*" The objections to their continuance are stated, and then the reasons for allowing them to remain are given, as follows: "The people who live in the vicinity of the slaughter-houses, as a rule, do not object to their proximity, or to the business, or to the hours at which it is carried on." This is a very strange argument for a sanitarian to use. Why do they not object? "On consultation they are almost always found to favor its continuance on account of the additional life and increased trade it brings to the neighborhood." Precisely so. If this be a sufficient argument it will justify the continuance of any nuisance in the city; it is a matter of pecuniary interest. "As to cleanliness, the houses many of them live in will not compare favorably with the slaughter-houses themselves." Then get an efficient Board of Health, one that will not attempt to palliate or justify the continuance of one nuisance by suggesting the existence of a greater in the vicinity. The most cogent reason, probably, was that "there are invested in the business many hundred thousand dollars which the material interests of the city require should be kept here, unless the safety of the public health absolutely demanded expulsion." This has always been the argument of the controlling element—the political element in the Board—the element that cannot be removed nor even changed in any important particular. This article was written in the interest of that element, as all the measures adopted and the arguments advanced to justify those measures are designed to show that "the safety of the public health (does not) absolutely demand expulsion." "Accordingly the Board waited until December, 1875, to make a thorough examination into the manner in which the business was conducted in this city." Notice was then sent to the proprietors that it was resolved "that section 55 of the code of sanitary ordinances of the Board of Health, which provides that the slaughtering of animals shall not be permitted at any place in the city of Brooklyn, be enforced on and after January 1st, 1876." "Applications were thereupon made for permits under the code." If section 55 of the code provided that the slaughtering of animals shall not be permitted at any place in the city of Brooklyn on and after January 1st, 1876, why accept applications for

*Communication addressed to the Common Council, August 1st, 1876, by the Secretary of the Board.

permits under the code? Why were these notices sent out so late as December, if the business was to be removed in January following? If it was a foregone conclusion that the business would not be removed, why were the notices sent?

Just here two distinct issues were raised: it was determined to grant permits to the Johnson avenue establishments, and to refuse them to those in Hudson avenue. Why?

"A thorough inspection of all the premises by inspectors . . . showed that the houses upon Johnson avenue were so arranged and located that there could be no question of the propriety of giving them the permits asked for, which were accordingly issued." Notwithstanding the 55th section of the code, permits were granted because "they are upon the edge of the marshes adjoining Newtown Creek, into which their drainage flows, and are removed a long distance from the built-up portions of the city." Opinions may differ as to what forms the built-up portions of the city.

In speaking of the sewer nuisance on Bushwick Creek this report says: "A bed of the most prolific disease germs, covering thousands of square feet, has been formed in the midst of a thickly-settled neighborhood, to poison and destroy human lives without limit." The nuisances are the same except in degree; the one is called "a bed of most prolific disease germs," while "the latter cannot, therefore, be an objectionable nuisance." A cogent argument certainly; because they are "upon the edge of the (filthy) marsh, into which their drainage flows," it is no harm to add to the filth. If these inspectors found a filthy cellar into which a cesspool was leaking, there would be no question of the propriety of permitting its continuance. No doubt it was considered a very strong argument when it was urged that "this location has been used for this purpose for the last fifteen years, and all residents within a half mile have established themselves with a full knowledge of the surroundings." The long continuance of the nuisance is very conclusive, and the fact that people will go into the neighborhood of a nuisance makes it harmless, is a very strong reason for abolishing all Health Boards, and this one in particular. The Report continues: "Indeed, most of them have done so because of the proximity of the slaughter-houses. The latter cannot, therefore, be an objectionable nuisance." Report, page 30.

The result of this inspection inspires us with a profound admiration for the acquirements, judgment, and acumen of the three sanitary inspectors who are made responsible for it.

Compare these conditions with the reasons for removing the slaughter-houses from Brighton, as given in the *Report of the State Board of Health of Massachusetts for* 1872.* "The floors of the slaughter-houses are of wood, and are saturated with blood. In most of them there is no sewerage; generally an *imperfect drain* leads to some *marsh* or low piece of ground, sometimes to a brook. The surrounding ground is filled with decomposing matter." The same Massachusetts Report, in contemplating the substitution of proper abattoirs for these slaughter-houses, says: "The probable result will be that Brighton, one of the most beautiful of the towns

* See THE SANITARIAN for October, 1876.

adjacent to Boston, instead of being a nuisance to itself and to all travellers through its borders, will be rid of all those things which now make it offensive." Thus a very similar question is contemplated from very different standpoints.

February 2d, 1876, it was resolved, "that the slaughtering of cattle, sheep, calves, or other animals in the slaughter-houses on Hudson avenue, in the city of Brooklyn, is hereby declared by this Board to be dangerous and detrimental to public health." "The hearing which followed consumed a month's time. . . . The slaughterers were represented by eminent counsel, and the question was fully explored and discussed in all its branches." Why the eminent counsel in the discussion? Was it a legal question or one for sanitary experts? If the former, why did not the Board consult its counsel before annoying the proprietors of these establishments? The facts established were "that the residents and property owners of the vicinity were almost unanimous, with few exceptions, in opposition to the discontinuance of the business, and stated that it was neither a nuisance nor objectionable." The Board when informed by these experts—the residents—that the business was not a nuisance, determined "that the slaughtering of animals at Van Iderstein's was not, and at the other houses, if properly managed, not to a degree sanctioning prohibition detrimental to the public health." The residents and property owners, who make up the public directly affected, showed the Board of Health, aldermen, policemen, and doctors as they were, that they knew nothing of the matter they were considering, and that when they *resolved* that the slaughtering of animals in Hudson avenue was detrimental to public health they were in error, and they straightway proceed to declare themselves in error and retract all they had previously asserted. We have said before that this is a remarkable report; it would be impossible to find anything in the whole range of sanitary literature to compare with it, and the authors may be assured that their labors will not fail to attract attention.

The same style of argument is used to excuse the continuance of cow-stables within the city limits; and in speaking of the Greenpoint oil refineries, etc., the oft-repeated phrase is used, "A class of nuisances exists in the northern section of the city the proper control of which *has taxed the resources of successive Boards of Health of this city for years.*" This means that the present Board has done nothing in the premises. We are told that "whether our factories do emit offensive odors that are detrimental to the health of the citizens of New York is a question. Though so often asserted, the affirmative has never yet been proven. On the contrary, this Board holds that it cannot be proved, and that the odors complained of are not even offensive to any great extent in that city." Whether they are offensive or not is a mere matter of taste. If the Board will send some of the contractors who have done them service to examine the odors, or to do any other work they may require of them, even the filling of sunken lots, they will most likely have it done to their satisfaction. If it be a mere question of sanitary science we do not know which of the members would be most likely to solve it. The New York people are very unreasonable, they in-

sist, on dumping garbage into the bay, while they object to nuisances in the creek, in which our friends are interested.

"House drainage as it should be" is a special report by the Secretary of the Board. We are told, page 28, that "the vital importance of this subject to the public at large has led this Board on several occasions to invite the participation of scientific and expert plumbers in its discussion, and we believe much good has resulted therefrom. The conclusions of the Board as to the requisites for a proper house drainage are more fully stated in a paper prepared by the *Secretary* under the direction of the *Board*." The Secretary's report justifies one of two conclusions, either that the members of the Board did not see it before its publication, or that they were utterly incompetent for the position they held. That an official document, published at the expense of the city, with the consent and approbation of the Board, of which the author was, during the absence of the President, "the chief executive officer of the department," should become the means of advertising a particular form of water-closet is unprecedented in the history of sanitary reports. It is simply disgraceful. That shrewd business men, misled by the position he held, employ him to write up the merits of their patent, may be understood; but that a Board, called by courtesy a scientific body, should allow such drivel and nonsense, such absurd and contradictory statements, to be published without having examined it, and should subsequently publish a printed retraction of its contents, shows an entire want of comprehension of true interest in the public affairs with which they were entrusted. We are told, on page 150, that "the chief objections to the Jennings closet are the large trap below it, etc., the offensive odors from which, together with those that have accumulated in the chamber formed between the trap and the plunger, will be driven to the air above by the descending water whenever the plunger is lifted."

On page 152, this scientific report, speaking of another closet, tells us that "when the plunger is lifted the large body of water in the closet rushes unobstructed down the soil-pipe, *forcing before* and *drawing after* it all *foul odors* in the pipes or about the closet. When the plunger is up the draft is always downwards."

Hereafter scientists and physicists in particular should take notice that they are called upon to remodel their teachings in regard to pneumatics, to hydrostatics and hydrodynamics. In all future editions of their works they will observe that when writing *against* a certain patent, gasses, since they are so much lighter than the surrounding fluids, will *ascend*, but when they write in *favor* of a particular patent, "*the draft is always downwards.*" The italics are by the author. Such nonsense is beneath criticism, but we have noticed it because so many merely glance at the plates and diagrams, and take it for granted that as "the following (the article in question) is offered from the experience of the officers of this department as a proper method of sewering a house to be applied under the conditions in regard to location, surroundings, and water supply existing in the city of Brooklyn," it must be profoundly scientific. The majority of readers will not stop to inquire why it is that for lighter gasses "the *draft is always downward*," while the heavier ascend.

T. P. C.

THE RELATION OF LAW AND MEDICINE TO ONE ANOTHER AND TO THE PUBLIC.

By CEPHAS BRAINARD, ESQ.

Proceedings of the New York Medico-Legal Society, December 5th, 1877.
Hon. GEO. H. YEAMAN, President, in the Chair.

Two learned professions meet with common objects—the two professions whose daily service comes most nearly home to the business and bosoms of all men in the routine of common life. Surely the object of this association of the two professions is not solely the simple but comparatively selfish one of acquiring a given quantum of knowledge, as the miser accumulates gold. Rather this is a branch or section of the great, the Universal Social Science Association of civilized lands, composed of the members of the two great and learned professions, whose lines of labor most frequently touch each other as regularly pursued. Its past discussions show it to be an advocate of what is sometimes called a Social Science policy. This is well defined in one of the most remarkable of recent books—the letters and other writings of Edward Denison, M.P. He says (p. 206): "It aims at utilizing, for the purposes of imperial, national, municipal, and individual life, the great stores of knowledge in every department of philosophy and science, which the mental activity of the last half century has created and accumulated, but which have not yet been employed to diminish the suffering and increase the happiness of humanity at large." To this end how advantageous is the calm and dispassionate comparison of views between the two professions meeting in this society. How essential their substantial agreement upon topics common to both, before the great stores of knowledge adverted to by Mr. Denison are really employed to diminish suffering and increase happiness. To be most usefully employed there must be an incorporation of the results of these accumulations in legislative action and in the common practices of mankind. The largest possible circulation of the topical papers read here contributes powerfully and directly to the latter result; but only mediately, and I think inconsiderably, to the former. So far as my examination has extended very little has been done or said here looking to practical legislation. Not that I design to suggest that the society engage in the business of procuring legislation generally, though no reason has occurred to me why, within reasonable limits, it might not properly do so.

The time seems peculiarly favorable for obtaining definite legislative action, guaranteeing these reforms in the law which the great advances in practical knowledge show to be desirable.

The limitations which some believed were set upon legislation, and which hedged about supposed rights, are yielding to the needs of the time. This change in judicial view and rule began some years since, but has recently become a settled principle of judicial action. Perhaps the strongest early manifestation appeared in the police

cases as long ago as 1857 (*People vs. Draper*, 15 *N. Y. R.*, 532), when our police was placed upon a better and more efficient footing.

It appeared again in 1865, when an attempt was made to overthrow the law which gives to parties whose property is destroyed by mobs a right of action against the municipality where mobs hold sway (*Darlington vs. The Mayor*, 31 *N. Y. R.*, 165). All remember the strenuous opposition, founded on constitutional objections, that was made to the health legislation affecting this city (*See Metropolitan Board of Health vs. Heister*, 37 *N. Y. R.*, 661, *and kindred cases*). Notwithstanding this opposition we have the improved health code—cattle are no longer driven in large droves through the crowded streets, and slaughter-houses have ceased to infect, infest, and demoralize the town. The demands of the body of the people for improved modes of travel, as incorporated in legislative action, and sought to be satisfied by capitalists, under legislative permission, are no longer thwarted by claims of supposed private right. Such technical claims our courts hold are not to stand in the way of those improvements which the age really requires (*Rapid Transit cases, not yet reported*). The disposition manifested by our Court of Appeals appears in the highest court of the nation. The legislative wisdom of some States provided, as was thought, for a better use of railroads in the interest of all parties. Individual right again raised constitutional objections, and the Supreme Court in the Granger cases (94 *U. S. R.*, 113–187) recognized and sustained the right of the body of the people to some consideration in the administration of *quasi* public trusts.

Some of these decisions may yet be subjected to criticism, but they will undoubtedly all stand the test of time and trial, and they show that the current of judicial ruling in this country is contrary to the technical spirit, the over squeamish regard for supposed private right which lies at the basis of the Wynehamer case, here (3 *Kernan's R.*, 278), and *Alkyns vs. Randolph* (31 *Vermont R.*, 226) in the State of Vermont, which are the very quintessence of the chronic conservatism of the past.

It is doubtless safe to assume that this is not formed as a total abstinence society; that it was not organized for the purpose of joining in any temperance crusade. An examination of your records will show, however, that a considerable proportion of the papers read here have treated of the effects of the use of alcohol upon men. A cursory examination of these papers has not disclosed to me any observations upon their use from the philanthropic stand-point, or any appeal to the class of considerations most in use among so-called reformers. The treatment has been wholly scientific or professional. The essays treat of "alcoholism," "methomania," and "dypsomania" as diseases, as forms of insanity.

Of "methomania" one of your essayists says that it "is a manifestation of brain disease; and that brain disease involves general impairment of the mental faculties, and consequently a form of insanity. Any man drunk and absent from business that he knows to be important, committing a crime in that condition, should be treated not as a criminal but as a maniac."

Another of your essayists says: "In a criminal case the question must be carefully examined; for if the guilty party has had attacks of delirium tremens, if it is ascertained that he is a dypsomaniac,

he ought to be confined in an asylum as any other insane; and no matter how well he may appear to be while confined, it is not till after a long time, probably ten years, before he can renounce spirits, or that he may be set at liberty without danger to himself or to society. No matter how much he might promise, swear, that he would not touch another glass, the inclination before that time is stronger than he—he cannot resist it as long as he can procure it."

The same essayist sets forth the results—near and more remote—of the use of alcohol as follows:

"Now, in ninety cases out of a hundred, drunkenness is first contracted by imitation and politeness, for it is considered very impolite by some individuals to refuse to drink when invited to 'join in.' It soon becomes a habit, and then constitutes one of the most incurable diseases. Every additional glass is one more stitch in that other Nessus tunic called chronic alcoholism, from which, when once entangled in its folds, it is impossible to come out, and Hercules-like, the drunkard dies in the most wretched agony.

"The disease is not even ended by his death, but its influence extends from generation to generation until the extinction of his race. Morel reports many examples of this fact. According to him the sequence is as follows:

"First generation: Immorality, depravity, excess in the use of alcoholic liquors, moral debasement.

"Second generation: Hereditary drunkenness, paroxysms of mania, general paralysis.

"Third generation: Sobriety, hypochondria, melancholy, systematic ideas of being persecuted, homicidal tendency.

"Fourth generation: Intelligence slightly developed, first accession of mania at sixteen years of age, stupidity, subsequent idiocy, and probably extinction of the family."

But quotations need not be multiplied. Putting aside all moral questions, all considerations philanthropic in their character, it has been shown by the essays before this society, as it has been shown elsewhere, that certain uses of alcohol touch the civil administration and the practice of the law at a great variety of points, but strikingly at the following:

1. As to testamentary capacity.
2. As to fitness to give evidence.
3. As to competency to contract obligations of a binding character.
4. As to general capacity for wise business management.
5. As to criminal tendencies.
6. As to responsibility for acts of a criminal character.
7. As productive of poverty and pauperism.

And as to all this matter the medical profession has brought from its storehouse of facts and experience a vast array of information, and resting upon this a mass of professional conclusion which cannot be controverted or denied.

It may well be assumed that their call now is to the legal profession—is for the payment of that debt which Lord Bacon declares every one of its votaries owes to it, viz., for the intervention of the lawyer in aid of every proper movement for the modification or the cure of so great an evil. We are ready to take a position in regard to proposed changes affecting the minutest details of the daily prac-

tice; we are not slow to discuss the question whether a summons signed by an attorney, or a writ in the name of the people, is the proper and convenient mode for instituting a suit, and rightly so. If any craft known to civilized society, throughout its long and continually brightening history, has been ready with all its powers, natural and acquired, to serve the cause of progress, that craft is the law; and ready it has ever been to enter that service with neither staff, nor scrip, nor money in its purse from those it thus serves. Surely the law should not be behindhand in efforts to secure a mitigation, if not the eradication, of this curse upon civil and governmental administration. Not as reformers, not as temperance men in the technical and narrow sense in which these words are used in every-day life, but upon the same principle, and in the same way, and with the same order with which we enter upon the advocacy of any great reform in civil affairs. How many times have we all draughted and followed them through the legislature at our own charges; how many times in the interest of society, but at our own cost, have we all taken part in efforts to procure what we thought good legislation or to defeat bad?

Yet here is a practice which in its effects touches the lawyer more nearly than the member of any other profession save that of medicine. That profession has brought here the wealth of its learning and laid it before the society; it has done at least a part of its duty; but I have not observed in any of our papers from my own profession any suggestions for a legislative scheme—to cure the evil, to remove the wrong as touching the administration of the law. It seems to me this can properly be expected, not in any radical or ultra reformatory shape, but as digested by the calm reflection matured by the large wisdom and experience, and sustained and approved by what Mr. Choate, in perhaps the best of his public addresses, termed "the conservative force of the American Bar."

It is not for me to do this, but it may not be improper to suggest the question whether any idea has yet been presented better than that which gives the law an executory principle, by conferring a right of action in favor of the person injured by the acts or neglects of the drunkard against the seller of the liquor used by him. May I also suggest a radical inquiry as to the difference discoverable upon principles of statesmanship and constitutional law between the common bar-room and the gambling-hell, or between the sale of liquor in the former and the sale of prussic acid and arsenic at the drug-store. And if no difference can be discovered, why not properly the same kind of legislation be applicable to all.

Some suggestions made here, looking to the subject of ventilation as applied to the public-school buildings, indicate the prevalence of a sentiment among the members of the society which perhaps justifies the additional observations which I desire to make.

The members of the medical profession, more than any other calling, are brought into immediate contact with the poorer classes. Sore sickness is incident to every family, rich or poor, and perhaps especially incident to the destitute and ignorant; and in the ministrations of the "doctor" it is a peculiar glory of the profession that none are neglected. On such occasions the physician sees the best side of human nature, the best feelings of the heart are aroused, and it is easy to infer from the condition of the mind, as exhibited by the

lowest classes in their afflictions, the capacity for improvement and progress of which they are capable. No one doubts the civilizing effects of pure air, and tidy, even if not artistic, surroundings.

If any proof were necessary, the extraordinary experiment of Miss Octavia Hill—in which she was assisted notably by Mr. Ruskin—which resulted in the purification of some of the worst and most debased dwellings in London, and in the real civilization of their inhabitants, and which transformed those dwellings into interest-paying investments, when before they had been a source of loss, is sufficient proof. But while it seems to me that the medical profession, in and of itself, cannot accomplish the needed reforms in the crowded tenements, it can do so with the help of the lawyer if he will wisely use his means for influencing and framing legislation, his opportunities of touching public sentiment at so many points, and especially the frequent calls upon him by capitalists for advice in regard to the mode of treating property and disposing of investments. The two professions coöperating can accomplish almost any desirable result in this direction. Is it not then proper matter for consideration, how much by legislation and how much by operation upon public sentiment can be done toward improving the dwellings of the poorest, and thus facilitating the practice of the physician among the destitute classes, and rendering his generous service more useful? Attention has not been given to the management of the commonest tenement-houses as it should be; effort is not made to keep them cleanly and to keep their inhabitants in the same condition. How much can the Medico-Legal Society do in this direction?

But there is another matter connected with this suggestion, as to which there should be legislation at once.

In the opening of the upper part of the city for dwellings by the building of the elevated railroads, and in the desertion of a section of the city about the Battery by the more profitable classes of business, a field is open for a reform which it is desirable should be accomplished.

No houses are now built of a convenient character which are within the reach of single families of laborers and artisans of the better class; if they are now to live anywhere in the city, it must be in tenements more or less crowded. There is no reason why the sections of the city which I have specified should not be redistributed or relaid out, so that small houses can be conveniently built, having abundance of light and air, which, in their rentals, would be within the reach of the average mechanic for his single family. The advantage to civilization, to good neighborhood, to health, to every department of social economy, secured by such a reform would be incalculable.

Let another matter be brought to your attention. It is, perhaps, mainly to be treated by public sentiment; but in that regard public sentiment should be educated. The police courts and the police justices' courts being uncivic institutions, we call the State into immediate contact with the largest body of our people—those the least educated—those who know least of the principles upon which a State is organized. Their knowledge of the law, of its administration and its practice, is derived wholly from these courts. If they are to respect the institutions of the country, they are to learn

to respect them from the administration of the law as seen by them. They never see, except at rare intervals and in a casual way, the higher courts of the country. They have no more idea of the appearance of the Supreme Court of the United States, of the dignity of its justices, the simple majesty of its proceedings, the solemnity of its debates, and the integrity which characterizes it, than they have of the local disadvantages as a place of human habitation of the moon. All they know of the law, they know from the police and civil justice, and from the lawyer who practices before him.

Then I say with the educated classes—especially with the members of the two professions, one engaged in the administration of the law, and the other dealing with these poorer classes to such a vast extent under circumstances where they are most susceptible—there should be a decided, a positive, a persistent effort to elevate the condition of these courts. I make no criticism upon any man now presiding in them, but I do say that they should be conducted with a dignity, with a sobriety, with a steady reference to the best principles of the law and to the best principles of administration such as is not found in all of them at the present time. The judge upon the bench should understand that he represents the State in one of its highest and most important forms of legal administration.

The controversies of the poor about a few dollars are more important to them than the controversies of the rich over their thousands, and their controversies should be treated with the same consideration, with the same gravity with which the Chief Justice of the Supreme Court treats a controversy before him. If this were done, these courts as a means of elevating society, and of the improving morals of keeping peace, would be of incalculable value. Our duty here is, by the creation and cultivation of a proper public sentiment, to so elevate and so ennoble them that they become constant and healthful teachers. A justice in one of these courts whose conduct is what I have indicated it should be, ought to be looked upon by society as one of its greatest benefactors. He should not be spoken of with contempt. His education, his surroundings, should be such that he can be welcomed to any society which he desires to enter. The terms "civil" and "police" justice should not be upon the lips of certain of our people terms of contempt, but they should be an epithet of honor, and when we come to that, we shall have made a long step onward in the elevation of man.

This is a little out of the ordinary line of your essays; it will not, however, do hurt, possibly it may be of some little good.

Law and medicine, in their administration, deal with individuals. The lawyer acquires a profound appreciation of the value of individual and personal right. The physician has an exalted opinion of the individual man, not only as possessed of mental capacity—of an immortal soul—but as possessed of a body "fearfully and wonderfully made," which is the subject of the profoundest study on the part of those who desire to be worthy of their calling. It is the valuation in both professions of the individual man which gives life and force and moral elevation to their activity, and which invokes the exercise of their best faculties. What I have said touches the value of the individual and goes to its just appreciation, and I would fain see realized by all the force of the promise and declaration of God himself when He says, "I will make a man more precious than fine gold; even a man than the golden wedge of Ophir."

THE WOMEN'S HOTEL.

NEW YORK, May 10th, 1878.

To the Editor of THE SANITARIAN: With all the peculiar developments of our age we may congratulate ourselves upon the growth of that beautiful humane spirit that finds time, in the midst of business and competition, to think of the lonely and unprotected. We have charitable institutions in abundance, many of them embodiments of the loftiest ideas of philanthropy. Few of them, however, seem to be designed to help those whose great desire is to help themselves and others by an independence both of action and living. Such seems to be the object of Stewart's Women's Hotel. It is not a charitable institution, though the terms are exceedingly low considering that it is a palace of luxury and comfort. It is necessary to add the last word, because luxurious apartments are often neither convenient nor comfortable. I have been the guest of many of the finest hotels in the country, and can say unhesitatingly that none of them are superior in appointments or attendance, while this has the added glory of a spacious library containing thousands of standard works of history, biography, poetry, fiction, science, and philosophy, together with many valuable books of reference, such as Appleton's and Chambers' cyclopædias and dictionaries, gazetteers, etc., in abundance. If the literary women of New York realized what this library is, and how much time they could save by making their home here, I presume they would crowd into it so rapidly that we should soon see a lamentable restriction posted, "No women from other States admitted"; and then what would become of me when I visit the great city, in which I feel lost even with the present privileges? The inside rooms are really the pleasantest, because they are so quiet and overlook the court, which is a delightful little park, full of beautiful flowers and plants, with a fountain in the centre. There are seven reception-rooms, besides the immense parlor. The existence of these, refutes sufficiently the published rumor that ladies are not permitted to receive their friends. One lady, who is almost broken down with the constant necessity of climbing stairs wherever she has lived, says that she feels as though this hotel was built expressly for her, and considers the elevator worth almost as much to her as she pays for all the comforts and luxuries received. I have heard but one expression from the guests, that of being agreeably disappointed, the reality being better than the expectation. There are minor restrictions that seem to be a hardship to some. The most important of these is that sewing-machines are not allowed in the rooms. Neither can artists cumber their rooms with the machinery necessary to their art. Guests may come and go, and eat, and sleep, and rest, and read, and study, and write, but so far as possible must avoid making a workshop of the hotel.

There is another regulation that has been commented upon with much severity by numbers of prominent women, some of whom have taken the trouble to rebuke me "for staying an hour in a hotel that is an insult to all women." Softly, softly, dear friends; you may happen to change your minds, and then you will regret your hasty conclusions. I encountered this obstacle unexpectedly, and became

so indignant that I know precisely how it is, and so you shall have an account of my experience. I sent on a request for rooms ten days before coming, and supposed that was all I had to do. I passed a sleepless night from Washington here, and arrived with a headache upon a rainy morning, and the restful idea of a woman's hotel in which to recuperate, rose before my weary mind with a charm almost equal to the outstretched arms of a loving mother. I stepped upon the cold, elegant marble; a colored boy opened the door to let me pass, and sat down again, permitting me to carry my heavy valise in; and as I walked toward the desk a tall, pretty, dark-eyed young lady gave me a glance of cool indifference. Neither she nor any one else offered to take my valise or show me to the reception-room, or even to suggest that I be seated for a moment. I ventured to say, "I desire to register my name and to be shown to a room?" "Have you got your letter of acceptance?" said she. "I don't understand what you mean," said I. Then she went to another desk and looked over some papers, and said, "I don't see your name here." Now those who know me best will admit that I have conquered a great deal of impatience during my life, but I hardly think they will believe I have such an ample store of it on hand as I discovered that morning. I informed the lady, among other things, that I was aware that I was in a hotel, and it would not be out of place to have some one take my valise and offer me a seat until the clerk could be called and the manager informed that I had come and intended to stay; and that a good breakfast would be agreeable to me; and that I was not in a humor to tolerate the suggestion that I needed any letters of recommendation to anybody in this country, least of all to the manager of the Women's Hotel. What all I managed to say will never be known, as reporters are not allowed in these sacred precincts. A little later I was seated in the cozy reception-room, and the genial clerk approached me with troubled eyes and said, "We will see what can be done. No reflections are meant to be cast upon any lady by the regulations, I assure you." He was too late, for my demon of impatience had with swift and irate fingers jotted down in the back of my note-book these fatal lines:

Oh vaunted charity, that scans
With cold distrusting look
The face of woman, to detect
If in its open book

Be blotted words or shadowed lines;
Refusing yet to lend
E'en common courtesy and trust,
Unless some man commend

With gracious words of character
"And his benign esteem!"
Thus ends in bigotry and cant
Stewart's divinest dream.

I take the trouble to insert these lines because they embody the feeling of many women who have read of the required letters of reference, and because they do especially show the unjust and undignified attitude of woman's mind when it jumps at a conclusion. After I had enjoyed this little burst of spite I happened to think that I had a bundle of letters of reference to other parties in the city, reformers *et al.*, among whom was the editor of THE SANI-

TARIAN, who must be informed of my standing and purposes before they could be expected to receive me or interest themselves in my plans, even though I might solemnly assure them that I perfected a scheme for the immediate introduction of the millennium. While reflecting upon this there dawned upon my mind, like the sweet calm of a May morning, the bright idea that, bad as he is, Judge Hilton is no worse than other men, and not so bad as some women, notably one who has patched up a fame for sympathy with noble efforts for the world's weal, until enthusiastic friends at Washington and here loaded me down with letters of introduction and assurances that when I met her the tangled web of life would immediately straighten. May be they were right: I have not yet met her, for the very good reason that she did not even take time to read their letters. She may be a Martha, troubled with much serving, and not in a mood at every moment to accept new claims upon her attention. Doubtless there is some such good reason for her action or lack of it, and all women will be charitable enough to say so. Let us then also pause before we pass harsh judgment upon men, especially those attempting a new and difficult work. Very few women who value themselves and their reputation would be willing to make a home here if the manager were reckless and indifferent as to the character of the inmates. In all candor I must say that were I in charge of the departed Stewart's noble charity I should most scrupulously guard its honor, and should be totally averse to accepting any and every woman who might take a notion to wander into the hotel out of the slums of the great wicked city. Some wholesome changes will doubtless be made as the experiment proceeds, such as setting apart rooms in which sewing-machines and artists' implements may be collected, general work-rooms, also reduction in prices, though how this can be done without constant loss, even if the hotel should fill up, it is difficult to see. Mr. Palmer, proprietor of the Palmer House, Chicago, told me that the expense of running his hotel was an actual average expense of $3.00 per day for each guest. This hotel has all the elegance of his, and is managed in the same first-class, extravagant style, at the rate of one dollar per day. If the terms are reduced it will be by an increased endowment, and not by profits accruing from the hotel.

I hope that women will not let false pride and foolish resentment blind them to the real benefit to our sex, of this new and much-needed feature in philanthropic experiment. There are writers, artists, teachers, and book-keepers already here, and some women whose occupation I do not know. There are some young girls and a few elderly women, whose sweet, patient faces wear a look of peace and contentment, as though at last they had found a haven of rest.

I am decidedly won from my first unpleasant impressions, and delighted with the Women's Hotel. Long may it live! I hope, however, that the manager will decide to receive for one night, or at least for a meal, those who are so unfortunate as to come without having received letters of acceptance, as it is not generally known that such a document is necessary; and many women will venture to come to New York now who would not dare to do so did they not suppose the Women's Hotel would receive and protect them.

MATILDA FLETCHER.

Editor's Table.

Long Island and Rapid Transit.—Awakened at last to the importance of making the country round about accessible, New York and Brooklyn are now intent on "rapid transit." The chief thoroughfares of the former are in process of being converted into literal highways of travel, and the latter has a commission devising ways and means to the same end. The Long Island Railroad Company, meanwhile, has anticipated both cities by virtually instituting rapid and cheap transit into that *new* old country, Long Island; has opened up speedy communication with a region of country which comprehends more of the pleasures, comforts, and necessities of life than any similar area of land and water in the United States. It is everywhere a well-recognized advantage of islands in general that they are continents in miniature; ordinarily comprehend in their structure sands, plains, hills, dales, meadows, streams, lakes, rocks, and mountains, all exposed to the refreshing breezes of a pure atmosphere from the face of the ocean, which, being cooler in summer and warmer in winter than the adjacent shore, tempers and mollifies the atmosphere the year round. Under such circumstances life luxuriates in its every form; the grass is greener, the bushes thicker, the flowers more fragrant, fruits more abundant, songsters more numerous and livelier, and the streams better stocked. Such are the common conditions of sea islands everywhere, and to none more than the one now under consideration—and the more by reason of the Gulf Stream, which approximates its southern shore.

In the summer time, particularly in the afternoon, the whole of Long Island is regularly fanned by the delightfully cooling breezes which sweep over it from the ocean to the Sound, which are peculiarly refreshing to the debilitated and overworked denizens of hot city walls who resort thither. And in the winter—when the ocean is warmer than the land—the air is again tempered in the opposite direction, commonly several degrees warmer than that of interior places of the same latitude.

Long Island and its appendages comprehend an area of about fifteen hundred square miles. The western and northern shores begin at Fort Hamilton, with the picturesque eastern side of the Narrows and Upper Bay of New York, take in Prospect Park,

Brooklyn Heights, the Navy Yard, Long Island City, the eastern shore of Hell Gate, and the whole southern bank of Long Island Sound, a chain of hills of unusual variety and beauty, extending in aggregate length about one hundred and forty miles. West Hills, the highest of the chain, in the town of Huntington, reach an altitude of one hundred and thirty-nine feet. Harbor Hill, at the head of Hempstead harbor, is nearly as high; and besides these there are many others of approximate altitude, exceedingly variable in form and direction, with their sides and tops covered, some with crops of cereal grains, buckwheat, fruits, garden vegetables, and trucking produce; some glimmering with green-houses amidst acres of floriculture, filling the air with fragrance; many with luxuriant wild foliage and flowers, in exceptional abundance in their season, corresponding in kind with more southern latitudes; and at their bases bounding numerous bays, estuaries, headlands, and cliffs, forming harbors, village sites, and retreats of unsurpassable beauty and enjoyment.

From the base of this chain of hills southward there is a gradual descent to the southern shore. For nearly three-quarters of the whole length of this shore—a distance of seventy miles, and from three to five miles in width—there is uninterrupted inland navigation prolific of a great and inexhaustible supply of shell and scale fish; and, in their season, the resort of numerous flocks of wild ducks, geese, and brandt, affording profitable employment to thousands of fishermen, and abundant recreation for sportsmen. Parallel with this inland bay—and reaching beyond at either end from Coney Island to Montauk Point—there is a continuous sand beach, which constitutes the ocean barrier and forms a line of surf which for grandeur, convenience, and safety for surf-bathing, is unequalled on the Atlantic coast. This beach is broken by but few openings, the chief of which is Fire Island Inlet, a famous summer resort for bathing and fishing, and the principal harbor on the south side for fishing-smacks and coasters.

Amidst these border lines extend the Hempstead Plains, an area of nearly one hundred miles in extent, which for a period of almost two hundred years was described as being, and generally believed to be, barren—until the settlement of Garden City—which makes this region bud and blossom as the rose; and the "Wilderness," an area of at least twice the extent of the Plains, which still remains almost uninhabited, and scarcely less noted now than it was two hundred years ago, as good "hunting ground." These woods still abound in quail, partridge, woodcock, and plover; foxes, many; and deer, occasionally. These last are now protected by law, and if this be enforced, a few years hence the increase of deer will add

renewed zest to the enjoyments of hunting, for which Long Island has always been famous.

Through this central region and along both shores run the three chief lines, with numerous connecting branches of the Long Island Railroad, placing every part of the Island and all its enjoyments within easy, frequent, and rapid communication with Brooklyn and New York.

From the terminus of the central line at Greenport there is ferry communication with Shelter Island, the largest of the appendages. This is a very significantly named retreat, situated between the two projecting capes into which the east end of Long Island is divided; and by this means—and Gardner's Island to the eastward—it is effectually protected from the high winds which sweep the outlying shores. It is about fourteen miles square in area, serrated on all sides with coves and miniature harbors, and luxuriantly covered with vegetation. The surface rises gradually from the shore to the middle to an altitude of upwards of two hundred feet, presenting an extensive view of the ocean, over the Sound and the blue hills of Connecticut. It affords to an extraordinary degree all the pleasures of surf and still-water bathing, boating, fishing, shooting, scenery, and climate; in short, few places are anywhere to be found which present more numerous or more desirable summer attractions. Of inland waters they are now as they were described as being, by New York's oldest historian, more than two hundred years ago:

"There is several navigable rivers and bays which puts in to the north side of Long Island, but upon the south side which joins the sea it is so fortified with bars of sand and sholes that it is a sufficient defence against any enemy, yet the south side is not without brooks and rivulets, which empty themselves into the sea; yea, you shall scarce travel a mile but you shall meet with one of them whose crystal streams run so swift that they purge themselves of such stinking mud and filth which the standing or slow-paced streams of most brooks and rivers westward of the Colony leave lying, and are by the sun's exhalation dissipated, the air corrupted, and many fevers and other distempers occasioned, not incident to this Colony. Neither do the brooks and rivers premised give way to the frost in winter, or drought in summer, but keep their course throughout the year."*

By the "navigable rivers" the author evidently meant the bays and harbors of the north side, and Gardner's Bay at the east end. With this explanation his account still holds, and to it may be added: there are also numerous lakelets and ponds, some of which are of

* A Brief Description of New York, formerly called New Netherlands, with the Places thereunto adjoyning, together with the Manner of its Scituation, Fertility of the Soyle, Healthfulness of the Climate, and the Commodities thence Produced, etc. By Daniel Denton. London: 1670.

great depth, which have their source in springs and never dry up; and these ponds and brooks are almost without exception prolific of trout and other choice fish.

At a depth of about twenty feet throughout the island there is a vast reservoir of *moving* water through the clean, silicious sub-soil, southward, which frequently breaks out into surface springs and streams, of almost perfect purity, affording, *naturally*, a perfect sub-soil drainage. But this in many places has been obstructed by the ignorance or parsimony of the people, in the erection of mill-dams and other obstacles; by the neglect of natural streams—allowing them to fill up with rubbish; by mud-flats at the mouths of creeks, which could easily be cleared; and, above all, by the "sunken lots" in the precincts of Brooklyn and Long Island city, *constructed*—in the progress of public works—regardless of the public health. Such obstructions and venalities are lamentably common throughout the whole country, and from them Long Island is by no means exempt; but these *blights* are easily recognizable by sensible people, and should be avoided everywhere as common sources of disease.

Brooklyn's annual stench and token of increasing mortality on the approach of summer, by reason of the "sunken lots," the filth dumped therein, and the sewage canal at one end of the city; and the marsh receptacles of sewage and slaughter-house drainage at the other, is again being *sit* upon by the Common Council. Would that it were even literally so!—that the Common Council and the Commissioners of City Works, under whose auspices those foul places were constructed and have been for a dozen or more years maintained, were required to hold their daily sittings in them until they were effectually abated: then might the unfortunate inhabitants round about hope for better things. As it is, from the action taken thus far, there is reason to expect nothing better than the annual sprinkling of some carbolic antiseptic, which affords temporary relief to the sense of smell, but which in reality has the effect of perpetuating the evil by arresting putrefaction for a time, but actually prolonging the process.

The Eastern District marshes are in equally bad plight, poisoning not only the present generation, but perpetuating a hot-bed of disease for future generations by reason of the unfinished and bad sewers, and slaughter-house and factory drainage saturating the soil. Besides these sources of disease at the doors of the people, there is a continually increasing danger to the water supply. The mucky ream which constitutes an important tributary of the storage reservoir at its north end is the chief drainage stream of the village of

Hempstead, and the reservoir consequently the receptacle of Hempstead filth. All observers know that no quantity of such filth taken into the system can be so small as to be devoid of danger, and that while those who partake of it in ever so small quantities may escape typhoid fever or other acute affections, they are nevertheless subject to a process of continued slow poisoning, weakening the system and predisposing to disease in general. How much this state of things now adds to the mortality from filth diseases in Brooklyn we have at present no means of knowing, only that the ratio continues large; and that such a condition of the water supply should be tolerated is alike disgraceful and dangerous to both communities.

New York.—The Report of the Citizens' Committee upon the Nuisance of the City and the Air we Breathe is a severe criticism on the shortcomings of the Board of Health in the face of the law and ordinances, particularly in regard to the *privileged* nuisances of Hunter's Point, and *permits* to carry on various offensive occupations in different parts of the city. The allegations are denied by the Health authorities; but no one who travels much about New York can deny the presence of filth and the stenches, or the enactment, Chap. 415, Laws 1851, that—

"§ 1. Whenever any nuisance shall be erected or continued on or near the boundary lines of the counties of New York, Westchester, and Queens, the same, and the persons by whom such nuisance shall have been erected or continued, may be indicted in either county injuriously affected thereby; and thereupon the same proceeding shall be had and taken, and the sentence of the Court may be enforced in the same manner, as if the said nuisance was situated within the county in which the indictment was found.

"§ 2. The record of any conviction under this Act shall be filed in the clerk's office of the county in which such nuisance is located, and thereupon process shall be issued to the sheriff of said county to abate such nuisance, in the same manner as if the conviction was held in the county in which the record was filed.

"§ 3. This Act shall take effect immediately."

Death-rates per 1,000 inhabitants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Pox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Typ. Fevs	Malarial Fevers.	Diarrhœal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500—4 weeks ending Apl. 20.	2095	25.13	1036	341	1	89	96	53	57	20	10	28	53	22	162
Philadelphia, 850,900—4 weeks ending May 4.	1184	18.13	385	199		29	46	3	25	6	34	1	9	5	74
Brooklyn, 528,000—4 weeks ending Apl. 20.	794	19.51	319	123		31	40	8	26	4	1		18		66
St. Louis, 500,000—4 weeks ending April 27.	370	9.64	150	53		5	4	7	3	5	5	12	6	7	26
Chicago, 460,000—5 weeks ending May 4.	589	13.37	315	73	4	17	9	5	22	39	9	6	5	1	76
Baltimore, 350,000—5 weeks ending May 4.	609	20.56	227	118		27	6	3	12	3	14	4	9	3	61
Boston, 363,000—4 weeks ending April 27.	544	19.53	416	131		20	6	12	8		8		11	1	
Cincinnati, 280,000—4 weeks ending April 27.	353	16.66	132	63	1	16	18	7	2	5	7		1	1	29
San Francisco, 300,000—month of March.	411	16.13	135	64		10	1	20	2	1	9		3	1	68
New Orleans, 210,000—4 weeks ending Apl. 28.	475	27.20	154	66	31	10		1	2		2	22	21		24
Washington, 160,000—month of March.	345	25.87	136	64		10	19		1	1	4		6	1	
Pittsburgh, 145,000—															
Newark, 126,000—month of April.	248	23.9	105	43		5	20		1	1	2		1		13
Providence, 108,000—month of April.	164	19.06	67	19		25	1	4	6	2	2		2	1	
Milwaukee, 123,000—month of March.	139	13.33	33	21	1	7	2		6					1	19
Rochester, 70.000—month of April.	99	10.70	20	16		2	1								10
Richmond, 77.000—4 weeks ending May 4.	109	18.45	56	16			8						3		13
New Haven, 60,000															
Charleston, 57,000—4 weeks ending April 27.	130	29.04	64												8
Toledo, 50.000—month of March.	58	13.65	23	8		3	2				1				4
Mobile, 40,000—month of March.	58	17.72	20	12				1			1		2		10
Dayton, 36,000—4 weeks ending May 2.	33	11.58		6		2									3
Nashville, 27,000—month of April.	43	18.96	10	12		3		1					1		2
Wheeling, 28,000—															
Buffalo, 170,000—															
Knoxville, 13,000—month of April.	16	14.97	5	4											4
Paterson, 40,000—month of March.	87	25.68	31	16		14	2		1						
Petersburg, 20,000—															
Selma, 8,000—month of March.	19	28.85	5												1
Elmira, 20,090—month of April	26	15.74	5	9		5									1
Yonkers, 18,500—month of April.	16	10.52	5	2				1							2
Memphis, 45,000—															
Detroit, 115,000—															
Syracuse, 60,000—Month of April.	47	9.52	5	10	7	2					4	2	1		5
Reading, 40,000—															
Sacramento, 21,000—															
Minneapolis, 44,000—															
Bowling Green, 6,000—															
St. Paul—month of April.	36		10	5			3							2	1

Pittsburgh.—Annual Report of the Board of Health for 1877: Population, 145,000; births, 4,215; marriages, 1,110; Deaths (exclusive of 236 still-births), 3,408. 269 were killed by small-pox, 401 by diphtheria, and by other zymotic diseases, 471—33.48 per cent. of the total mortality. Deaths from consumption,

249—7.30 per cent. 62 per cent. were of children under five years of age. Death-rate, 23.5 per 1,000. The large mortality, from preventable causes especially, is attributed by the health officer to "the same difficulties which have existed for a number of years, viz., a lack of sufficient force and funds." It seems not to have occurred to the civil authorities that true economy consists in the protection of public health; that vaccination is a thousandfold less costly than sickness and death from small-pox; that to cleanse and repair sewers, and to provide for the complete and safe disposal of filth in general, is as nothing compared to the cost of sickness and death from diphtheria and other filth diseases; that, in short, the sickness and death of 670 persons from small-pox and diphtheria cost in *money loss* to the city of Pittsburgh, through the impoverishment of her people, certainly not less than from $100 to $500 each, *or more than two hundred thousand dollars*—an amount sufficient to reduce the mortality of the city next year to 10 per 1,000, or, in other words, to save, *to economize* 2,000 lives worth a half million of dollars, to say nothing of the pain and sorrow.

The report is a creditable one to the health officer, who has evidently done the best he could with the "force and funds" at his disposal; but it is disgrace to the city.

State Medical Society Transactions.—*The Alabama Medical Association*, being a *State Board of Health* in virtue of statute, the transactions are peculiar, in that they represent the Association in its dual capacity.*

First after brief minutes of the three days' meeting follows the report of the Board of Censors, summarizing the "regeneration of the medical profession in the State of Alabama in its ethical and educational relationships, and the elevation of the profession to the high position of dignity, influence, usefulness and honor, which of right it ought to occupy before the law of the State and before the bar of public opinion," as shown by the recent legislative enactments in constituting the Association a State Board of Health, and regulating the practice of medicine in the State, giving the profession a legal status in Alabama above that of any other State in the Union.

The address of the president, Dr. E. D. McDaniel, is fully appreciative of this high dignity. *Education* in its most enlarged sense is right worthily handled as the subject above all other subjects demanding the attention of the medical profession for the people no less than for themselves. By it only can the profession maintain the respect of the people and the dignity with which it has been endowed by the State.

The annual oration by Dr. Edward H. Fournier is devoted to the therapeutics of alcohol, which he concludes, whatever may be its mode of action in the economy, is under certain conditions powerful in sustaining the body, and therefore a useful agent in the hands of the physician. "It bridges over the pit-falls which the complicated exigencies of modern life are constantly digging for us . . . As long as there are inequalities in the daily ratio of waste and repair to be rectified, so long we shall get along better with wine than without it; for this, looked at from the widest possible point of view, is the legitimate function of alcohol—*to diminish the necessary friction of living.*"

With how much greater potency might the orator have said: But for every pit-fall bridged over by the use of alcohol, even in the hands of the wisest physicians, a thousand are created by

* Transactions of Medical Association of Alabama—A State Board of Health, 1877.

the same agency; and so long as *such* inequalities in the daily ratio of waste and repair of human health and life exist, how is it possible to reconcile a knowledge of them with the advocacy of the use of such an agent? For, looking at the result of the common use of alcohol in connection with the complicated exigencies of modern life, into the pit-falls which it is digging from the widest possible point of view, it looms up as *the* vice of all others, the most devastating—the *blight* of civilization. Alas that it should find an apologist in a State Board of Health!

Dr. Jerome Cochran contributes thirty pages in advocacy of the personal contagiousness of yellow fever, regarding the now fashionable *germ* theory of the origin of disease in general as a strong point in favor of the hypothesis which he holds. He fails to show, however, why, if germ origin is an evidence of contagiousness in yellow fever, it is not equally so of intermittent and other diseases generally attributed to the same kind of origin. To our mind, as well speak of the contagiousness of frost-bite, because a large number of persons exposed simultaneously to an intense degree of cold are stricken with chilblains, as to speak of the contagiousness of yellow fever, because a large number of persons exposed to the emanations of decomposing filth under a high temperature are stricken with it. Organic matter in a state of decomposition does, indeed, swarm with living germs, but except in numbers—so far as science has as yet shown—such germs are in no respect different from those which may commonly be found in the secretions of the alimentary canal in healthy persons. That myriads of invisible living germs float in the air is no more true than that myriads of invisible particles of organic matter in process of decay in like manner there float, equally liable to be taken into the human body; and why we should assume that the former and not the latter are the essential cause of disease we are at a loss to understand. Wherever filth is most abundant—and above all if it is in process of putrefaction—or wherever morbid changes in the organic body are in progress, there living germs swarm the thickest; but that they are the cause of putrefaction in filth, or the morbid changes observed in the progress of disease, is as yet far from having been demonstrated, and no less inconsistent with the natural history of organic germs everywhere in the air we breathe than with the most successful means of preventing or "stamping out" yellow fever and other filth diseases by cleanliness, or by the destruction of the filth from which such diseases spring.

Dr. I. S. Weatherly contributes a paper on syphilis. He accepts the teachings of Professor Gross and Dr. Simms, that much is to be gained by enlightening the people on its prevalence and dangers; and advocates inspection, and such a police of "every one, male or female, as soon as known to be suffering from syphilis, in some way, so as to prevent the communication of the poison to others."

Other papers read were: Lightning Stroke, by L. E. Starr, M.D.; Infantile Diarrhœa, by M. H. Jordan, M.D.; Report of Cases, by E. Mason, M.D.; and Report by W. D. Bizzell, M.D., Secretary, giving a brief account of the nature of prevailing diseases, and mortality of Mobile, for the year 1876.

The New Jersey Transactions,* besides the usual delegates' reports from other societies and the minutes, consist of address by the president, H. R. Baldwin, M.D., on The Physician—Physi-

* Transactions of Medical Society of New Jersey, 1877.

cally, Mentally, and Morally Considered; the Care of the Skin as a Means of Prevention and Cure of Disease, by A. W. Rogers, M. D.; Hay Fever, or Pollen Poisoning, by E. J. Marsh, M.D.; and several important committee reports.

Essex Water Supply, by Lott Southard, M. D., begins with giving the mortality statistics of Newark: Population, 126,000: deaths, 3,689 — 29.96 per 1,000. From preventable causes, 1,233, or about 33 *per cent. of the whole.* This excessive mortality is attributed, and doubtless rightly so, to foul air and foul water. Of the water supply: About 55,000 of the inhabitants are supplied by the Newark City Aqueduct Company; the remainder — 70,000 — from wells, and these (the wells) derive their supply from the filtration of the rainfall through a "large amount of refuse, waste, and aqueduct water, deposited in cesspools and sewers sprinkled over the surface . . . An ordinary city lot is 25 by 100 feet. The front of this for 60 feet back from the street is usually occupied by buildings, areas, walks, etc., leaving a small yard 25 by 40 feet, in which must be dug-well, cesspool, cistern, and privy. The average depth of wells to surface of water is about 12 feet; . . . cesspool and privy, 8 feet deep, . . . 4 feet higher than the surface of the water in the well," within the space of 25 by 40 feet. "It is evident . . . there cannot be more than from 15 to 25 feet of earth between the bottom of the cesspool and privy and the surface of the water. . . Allowing five persons to a family, and a cesspool and privy for each, we have 15,000 cesspools and privies within the city limits, and as many wells; in reality there are many more."

Analysis of these waters by Prof. Wurtz shows "in the well 21.29 grains of solid constituents to the imperial gallon, being nearly four times as much as in the Passaic water; . . . 8.75 grains of organic matter in the well, being nearly fourteen times as much putrescible impurity as in the river water; . . . chlorine, 3.1, or seven times as much as found in the aqueduct water; . . . 5.-233 of sodium chloride, being seven and three-quarter times as much as found in the river water."—The wonder is that 29.96 live, not that so many die.

Dr. C. L. Deahler reports upon the general prevalence of zymotic diseases in Mercer county, and especially of *Diphtheria*. "The first cases appeared in July, shortly after warm rain, in several families living in the same locality . . . with an impervious sub-soil; . . . houses mostly without underground cellars. . . Condition of streets, yards, and out-houses, with but few exceptions, decidedly unsanitary. Of 57 houses infected, 16 had good natural drainage; 41 had not. In 15 houses with dry cellars, 40 cases; 12 with wet cellars, 29 cases; 30 with no cellars, 71 cases. . . Of 29 families 23 received it by contagion; 5, not known—contagion probable; 1, contagion not probable, as the house was located in the suburbs, to which the children had been scrupulously confined. A majority of the cases traced their origin to the public schools, and as these are efficient agents of communication in this, as well as similar diseases, it is a question whether the closing of them under these circumstances should not be imperatively demanded."

Other reports, of the district societies in particular, are fruitful in practical information on the etiology of zymotic diseases not only, but on their prevention and treatment; and also on a variety of special subjects. The Society shows much excellent work; but it is put together so heterogeneously as to lose much of its significance.

The Present Position of Sanitary Science: The Address of Edwin Chadwick, C.B., specially revised by the author for and contributed to THE SANITARIAN direct, is concluded in this number. We are much gratified with the attention this important paper has received from the press throughout the country, many important and liberal extracts having been republished. Meanwhile, abroad, though not published entire in any other health journal than THE SANITARIAN, it has also been widely circulated, and is being translated into French and Italian for still more extensive use. It is unquestionably the ablest summary of sanitary science hitherto published, and should be given the widest possible circulation everywhere.

Dr. John W. Trader was President of the Medical Association of Missouri, and gave the stirring address on the importance of State Medicine, etc., to which we invited attention in our last number, and *not* J. W. Fraser, as the type-setter made us say. Moreover, we are glad to acknowledge the receipt of a copy of the said Address, in separate form, reprint from the Transactions. It is well worthy of extensive circulation.

The Dansville Rest Cure.—"Our Home on the Hill-side" we welcome again to our advertising pages, as being one of the most healthful retreats for invalids in the United States. It has the advantage of long experience under the most favorable circumstances of healthful surroundings, beautiful scenery, excellent drainage, and an abundant and inexhaustible supply of pure water —conditions in the highest degree promotive of the objects of the institution, and all thoroughly utilized by accomplished superintendence and internal management.

Burning Oils may be handled with more convenience, tidiness, and safety by the use of Coleman's Elevated Swinging Transportation Cans than by any other means we know of; and we take pleasure in commending them for both transportation and family use. John H. Coleman, No. 2 Liberty street, New York.

The Girondin Disinfectant, admitted to our advertising pages this number, should not fail to attract the attention of all health authorities and others who would follow filth-cleansing with thorough disinfection. It is one of the best disinfectants known. Messrs. *Park & Tilford,* New York, sole agents for the United States.

International Review, May-June contains: Science and Theology, by James Anthony Froude; The New King of Italy and the New Pope, by Prof. Angelo de Curbenatis; War—Three Sonnets—by Ray Palmer; United States Provisional Court of the State of Louisiana, by Judge Charles A. Peabody; Reason and Sentiment, by Henry C. Pedder: The Bible: I. *Egyptology and the Bible,* by Philip Shaff; II. *The Gospel according to St. John,* by Lyman Abbott; Learned Women of Bologna, III.–IV., by Mme. Villari; The Moral Problem, by Mark Hopkins; The Future of the Erie Canal, by John B. Jervis, C.E.; Elements of National Wealth, III., by David A. Wells. These articles all speak for themselves. The eminence of their authors is a sufficient commendation. A. S. Barnes & Co., New York.

Moral and Social Science in Public Schools. — Two important Bills have been introduced in Congress for the promotion of this object in the District of Columbia especially, which we regret the want of space in this number prevents a fuller notice of. They will receive further attention in our next issue.

Books Received.—Parkes' Practical Hygiene, fifth edition, Lindsay & Blakiston, Philadelphia; Bayles' House Drainage and Water Service, David Williams, New York; Leonard's Vest Pocket Anatomist, C. H. Leonard, M.D., Detroit.

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HYGIENE IN GEOLOGY AND AGRICULTURE.

By A. B. Tadlock, A.M., M.D.

"O fortunatus nimium, sua si bona norint, Agricolus."—*Virgil.*

"Mens sana in corpore sano."—*Horace.*

Theoretically, the highest estimate obtains among civilized nations of the laws, means, and contrivances which secure the advance of physical beauty and strength. But practically there is no interest of equal importance so much abused and disregarded as hygiene. In this, the influences, separate and combined, of both State and Church, are and have been sadly perverted; lucre, novelty, arrogance, and other baser motives being allowed to subvert, in degree, the higher objects of secular, social, and religious education. All these avenues of social and political life might be scrutinized under our subject in its fullest meaning if violence to brevity could be avoided; so intricately interwoven are our physical and moral relations, and so dependent are we upon rural economy. But we must confine our attention more strictly to the relationship of hygiene, agriculture, and geology. First, however, by way of parenthesis, we observe that each of the sciences, in its advancement, contributes more or less to the development of the others, and that each in turn strives, by application and comparison, to utilize the results of the experience of all for its own advancement: this liberty is the happy prerogative of every scientist, but to the medical expert it is more than a prerogative. Humanity makes it his imperative duty to seek and cull information from every source, and so we find medicine, true to her purpose, ever pressing through the avenues of collateral sciences and investigating most assiduously nature's hidden and untrodden paths for new and useful knowledge.

Geology, though of recent origin, and as yet rather experimental, has already contributed much that is valuable to medical literature, and its application to hygiene has recently enlisted more than ever the attention of the medical profession. Topographical hygiene, with reference to local conditions and influences, should be as much the study of the architect and agriculturist as that of dis-

play, convenience, or profit. General information of and familiarity with the study of the natural sciences should as justly distinguish the truly practical and successful farmer from the pretender and imitator as the erudite physician, thoroughly versed in all the branches of his profession, should be known from pretenders or from professional specialists, notwithstanding the advantages of special application, which should command our consideration and respect. As a practical illustration and application of this principle, we have, by intercourse with the world, become acquainted with a geographical disposition or range of disease, the causes of which have been wonderfully elucidated and explained both by observation and experience, aided by the sciences of meteorology and ethnology. Some diseases, such as yellow fever for instance, we find belong almost exclusively to certain zones, as if controlled mainly by thermal influences, while the lunatic suffers an exacerbation of his fits during the light of the moon. Much of life, whether controlled by climate or by civilization, is a prolific source of constitutional deterioration, attended by peculiar characteristics, and best accounts for the extinction of races and nations, whether barbarous or civilized. Greece and Rome, amid the glories and perfections of their nationalities, became effeminate, and lost their strength and influence almost as effectually as did the aborigines of America. The Esquimaux and Laplander, subjected to their long nights of winter and cold; the African and Hindoo, with their eternal summers, live differently, and likewise possess peculiarities both pathological and physical. Bilious fevers and acute diseases belong most commonly to the one, while scurvy and chronic ailments are common to the other. Climate in part explains why only one dies of consumption in Stockholm, while three die of that disease in London, Paris, and Berlin, and four in Havana.

Again, material aid in the study of hygiene and local influences is derived from geology, chemistry, and botany. By them many occult questions in diseases have been satisfactorily explained. The earth and air contain the elements of organization and decay, as well as those of organic life; and it is strange, but true, that where organic vitality is most active, usually the processes of death and putrescence also are most busy; the evolution being maintained, too, by influences common and essential to both. For example, moisture is needful for the growth of vegetation, and yet it is the prime promoter of both vegetable and animal decomposition. Hence importance attaches to the conditions of the air and the earth as to heat and cold, poisonous gases, influences of winds, composition and condition of soil, etc., as affecting unmistakably the physical, intellectual, and moral conditions of society as well as individuals. The chief among the influences attributable to the earth are those due to surface, quality, and condition of the soil.

The contour of a country, or particular locality, has much to do with facilitating or retarding drainage, also in giving direction to the winds and in modifying their gaseous properties. Local and relative elevation, however, affects the hygrometrical state of the atmosphere more than the positive geographical elevation; for salubrity and dryness may be obtained frequently at moderate eleva-

tion, owing to soil properties and drainage facilities. Winds from the ocean or desert are comparatively dry, the one on account of the absence of the necessary moisture to produce even vegetation, the other because the surface of the water, being smooth, is a poorer evaporator than that of porous soil, or that of a surface widely extended and multiplied by growing vegetables and by various inequalities. Every addition to the extent of surface, whether due to vegetables or animals, or to unevenness of contour, multiplies and increases the evaporating facilities. Thus the hygrometric condition of the atmosphere is preserved, while moisture, with the gases, is being constantly dissipated or absorbed, or gathered up into the higher air to form clouds and rain. In this way it is estimated that eleven-twelfths of all the fluvial water that falls in the Mississippi Valley evaporates before reaching the Gulf of Mexico. When we consider the vast amount of material thereby elevated with the water, in solid and gaseous forms, by the process of evaporation, and thence transported on the wings of the wind, the importance of proper locations for dwellings and agricultural purposes becomes evident beyond question. Many plants that will not grow exposed to salty sea breezes will flourish when protected by a forest, a hill, or even a fence, and the destruction of forests between towns and malarious districts has been attended with disastrous effects. The presence of a mountain or high hill may be very essential in giving salubrity to a place which would otherwise be very unhealthy. The atmospheric influence is truly such that different products are frequently seen flourishing on opposite sides of not only mountains, but even hills and rocks. Is it not obvious that a proper observance of these truths would serve as a valuable guide in locating dwellings, camping-grounds, and cities and towns, and also admonish us to plant and protect forests?

The physical constitution and condition of the soil, also, very materially affect the healthfulness of localities, and it is with reference to these that we deal with geology as applied to medical and agricultural hygiene. Its chemical properties are imparted to the water, whence, by evaporation, they are diffused through the air in gaseous forms, or, by capillary and vital attraction, they become incorporated into and make up a part of all vegetable organisms, and even mold and preserve the integrity of the organic and functional character of both animal and vegetable existence. Truly, "God formed man of the dust of the ground."

Though chemically and geologically the organic and inorganic elements which enter into the body are very unequally distributed over the earth, Dame Nature, for the better accomplishment of her grand work, constantly essays an equalization and general division through her various agents, viz., the distilling dews, the falling rains, the winds and electric currents. Here we have coal and iron intermingled, there we find one without the other; freestone or limestone is found to be the formation, or soda and potassa exists in abundance, with or without the presence of silica, phosphorus, alumina, or magnesia. But, notwithstanding nature's efforts to universally equalize the inorganic elements, yet climate forbids this universal utilization for all plants, hence the division of the

vegetable kingdom to suit different climates, and in this way arises the necessity for commerce and the arts.

Again, agricultural chemistry demonstrates how much different vegetable growths depend upon the character of the soil for their material supplies, and also informs us that the products, whatever they may be, possess properties and qualities peculiar to the soil and air in which they grow. Some injurious peculiarities in crops, noticed by the practical farmer only as something mysterious and irremediable, are to the analytical chemist and scientific farmer intelligible and easy to cure. For example, wheat is often seen in places or "spots," "straggling" as they call it, and falling as soon the head begins to form. Chemical analysis teaches us here the want of the proper amount of silica in the soil. So the physician often finds the bones of his patients too hard or too soft, and inclined to bend or fracture, and discovers scientifically that the phosphatic deposits in the osteoid tissues are unnatural as to quantity. He further understands, by a knowledge of physiology, that the difficulty may not arise alone from an unnatural supply of the phosphates, but may be owing to an unhealthy assimilation—which no doubt is most generally the case. We know that that mysterious and unique process, assimilation, is not so easily marched and countermarched with our present system of medico-physical tactics as it is to add to or lessen the silica of the soil for the wheat or that of the phosphates for the stomach. But it remains for practical medicine and medical chemistry to apply these scientific deductions to hygienic usefulness. For example, reasoning *a posteriori*, analysis of healthy blood gives us a certain proportion of iron, the want of which in its due quantity constitutes a condition of ill health, called anæmia. Likewise, by observation and experience, we know that this may be occasioned either by the want of proper assimilation or for want of nourishment containing the due proportion of iron. If it should be the latter, we may trace the deficiency to the soil on which the wheat or other products furnishing the nutriment had grown. Cereals grown on a calcareo-ferruginous soil show by analysis a predominance of iron and phosphates, while a deficiency of these substances obtains in a carboniferous soil. The following extract illustrates the remote influence of geological elements upon the system. Dr. Moffat, in an interesting paper which he read before the British Association at Liverpool, said that "the district in which he practised consisted geologically of the carboniferous and of the new red or Cheshire sandstone system. That anæmia, with goitre, is very prevalent among those living on the carboniferous, but is almost unknown among those residing in the new red sandstone; that analysis of the soil and the wheat grown shows a predominance of iron and phosphates in the latter region, but to a deficiency of these substances in the carboniferous district he ascribes the liability to the disease, which indicates the want of iron-oxide naturally contained in the blood."

Again, it is discovered that a tainted and filthy condition of soil may produce crops large and luxuriant, but possessed of principles actually deleterious to health. David Forbes, F. R. S.,

says: "As far as present experience goes, it indicates that continued use of sewage over the same land ultimately tends to produce an unhealthy condition of vegetation, and certainly it appears to have been proved that a limit is soon reached, beyond which the application of more sewage may even be positively injurious." But our space will not permit us enlarging further on this part of our subject, or adding other extracts in its support.

Capillary attraction, absorption and evaporation, being the chief agents in the work of displacing and eliminating the materials composing the soil and subsoil, it will be expedient to consider some of the conditions which affect these chemical and natural forces. Among them may be mentioned color of the soil, its kind, compactness, and relative capacity for heat, moisture, and electricity, and the subsoil drainage. Since the rays of the sun which strike the earth are partly absorbed and partly reflected, those colors that possess the greatest capacity for absorbing and retaining solar caloric will contribute most favorably to those processes whose evolution depend so much on heat, viz., fermentation, decomposition, and gaseous emanations; and those in turn are prime promoters of vegetable vitality. That the degree of heat imparted is influenced by color, actual experience and observation furnish ample evidence. Every ploughman well knows the change of soil temperature, passing from the light-colored clayey to the dark or black alluvial soils. We have all noticed the snow disappearing first from about the black roots of trees and stumps and from darker spots of ground. We learn from this that if it is necessary to increase evaporation and phosphorogenic emanations from the soil, in order to obtain larger and more luxuriant crops, it may be done by increasing the heat of the dirt by simply darkening its color with a mixture of charcoal, muck, or some other like substance. But this increased evaporization must draw its supplies, especially during long drouths, from the subsoil, which may possess poisonous properties and be the means of engendering an unusual virulency in disease. This admonishes us to fill cesspools and dried ponds with clay, or other light-colored substance, so as to lessen the heat and evaporation. Also, for coolness, to paint houses with light colors as well as to wear light clothing. (But where is the remedy for the black horse or the Newfoundland dog? or have they compensating elements in their physical organization?) The thermal influence of color is also of value to the physician in treating disease terrapathically. Terrapathy no doubt deserves greater consideration than has been given it by the profession. Earth is used empirically as a medical agent by the people, and its potency has not been mistaken. Besides its thermal properties it is eminently possessed of those of electricity and absorption, to which is due the value of pulverized clay as an application to old ulcers, to incised and poisonous wounds, such as snake bites, stings of insects, etc. To this it may be added *apropos*, that the use of terra alba (sometimes bought and sold for sugar) in our coffee may be more profitable to the manufacturer, but its external use would be more serviceable to the consumer.

The kind of soil has much to do in determining its compactness

and capacity for heat, moisture, and electric tension. Argillaceous and calcareous, and the calcareo-argillaceous soils, without the admixture of sand, are good to retain moisture and withstand drouths, and on this account they furnish the best of subsoils, but are bad for surface, because cold and negative so far as vital and electrical phenomena are concerned. Alluvial, sandy soils, with sediments of vegetable and animal remains, obtain greater elevation of temperature, are electrically and magnetically positive, are consequently the best to carry on evaporation and to keep up the force of attraction, other conditions being favorable. The exhalations, however, from such localities often poison the atmosphere with zymotic and malarial effluvia, causing fevers, agues, and other diseases. Still, with a clayey, humid subsoil, such as described above, to retain the necessary moisture to supply the demands of a free and constant evaporation, this furnishes the highest degree of fertility, and with proper caution, guided by hygienic principles, may generally be made comparatively healthy. The silicious, bituminous, sulphurous, and ferruginous soils are more desirable for health, etc., if properly cultivated, and are not subject to waste through subsoil drainage or too free percolation, yield abundant crops that are preferable for market and for food, because vastly superior in quality. This idea was practically illustrated in advance of the theory by the enhanced value in market of products from one country or district over those of other places. For example, in noticing quotations of wheat in New York market we see that prices range highest for that brought from districts or States having the above soil characteristics, viz., the Red River of British America, Wisconsin, Oregon, Colorado, California, and the Alleghany slopes. It is the quality (which depends upon the soil in which the wheat grows), and not the quantity, that commands the extra prices.

Again, the inhalation of impalpable particles diffused through the air from local emanations has a hygienic significance. For example, a voyage on the ocean, or a residence by the sea-side, where the air is thoroughly impregnated with sea salt, often masters diseases otherwise invincible. And so we may have an atmosphere holding in suspension iron, carbon, sulphur, zinc, lead, etc., as representing the geological and mineral characters of different places. Sulphur pervades the air of Saint Louis district so much that surgical instruments exposed soon become blackly coated with sulphuretted carbon. Miners of lead, as well as painters, are subject to lead-colic. And just so with miasmatic poison, or other materies morbi, which reach the system by absorption and inhalation. It is well known that chemical substances are found incorporated in vegetable growths which are entirely foreign to the producing soil, so that fields well cultivated with proper fertilizers absolutely draw and appropriate their neighbors' substance. Such is the result of the use of plaster, most particularly on clover crops. We believe, however, that criminal codes take no notice of such larceny, but allow neighbors to pilfer from each other in this way without fear or restraint. Laws generally forbid nuisances which are considered injurious to health and happiness. Thus,

also, the portable nature of materials by the air, even from a great distance is recognized by the law-makers. In South America, Humboldt found ague patients 3,000 feet above and miles beyond the districts from which the miasmatic poison arose. Innumerable instances of this aerial transmission of impalpable and unseen matter might be given, but there is another way equally convenient and effectual that claims notice. It is that by which water is made the communicating medium.

Water being a good solvent for substances, organic and inorganic, very susceptible of capillary attraction and evaporation, and being so universally distributed, whatever belongs to earth or air capable of reduction to an aqueous or gaseous form may exist here in liquid suspension, ready, as it were, for a consumer. The clear crystal fountain, gushing from the mountain side, bears with it representative particles of the mineral, vegetable, and animal substances mingled with the soil through which its waters have been filtered. So in our daily supplies of water, possibly we consume substances of this year's growth and dissolution and those of the deepest or remotest geological formations mixed in the same cup. Thus we might unavoidably introduce into the system directly poisonous gases and debris; or take it indirectly in the consumption of meats and vegetables vitiated with such matter in their growths. Milk sickness furnishes a good example of this, which is a disease supposed to be caused by drinking the milk and eating the flesh of cattle that had previously eaten or drank a certain poisonous substance. Examples of the evil effects of using unhealthy water are too numerous and familiar to need further notice, while the advantage derived from the use of mineral water for the restoration of health is unquestionable. Then it is sufficiently obvious that the hygienic condition of a people may depend more or less upon the permeability and capillary condition of the soil and subsoil of their locality. For it has been shown that by aqueous permeation substances are wonderfully susceptible of subsoil transportation. This accounts for the appearance of poisons, especially in cities or places remote from cumulative sources, such as cesspools, sewers, garden-houses, cemeteries, and the like. It is not unreasonable to suppose that these underground streams and capillary currents may convey impurities from neighboring places, not only to affect our wells and springs, but also to impart unwholesome properties to vegetable protoplasms, rendering the use of both dangerous. It would be wise to reject the first fluvial washings of a rain from our cisterns, especially if an epidemic prevails, lest the air might hold in suspension toxical evaporations. Parts of cities situated upon very porous, permeable soils have been noticed to be first and most virulently visited by cholera epidemics. No wonder, since the microscope unchallengeably discloses the horribly disgusting fact that the water for domestic purposes in our cities does habitually contain visible particles of human excrements.

Without more conclusive evidence in favor of the infectious nature of cholera, we can in no other way so satisfactorily account for the singular phenomena belonging to its course and selections. But by this hypothesis (waiving the idea of theory) its contagious

nature is easily and conclusively explained. Dr. Snow, of London, believes that "the poison is swallowed with the food we eat or with the water we drink, and that its multiplication takes place in the alimentary canal, whence a new and abundant crop is voided." The feasibility of the major proposition to thus account for the portability of cholera poison is abundantly supported by well-authenticated examples. "The occupants, numbering about seven hundred, of the Asylum for Infants, and the House of Occupation, in Southwark, England, escaped a single case of cholera in any of the three epidemics, while the disease prevailed extensively in the streets in their immediate vicinity, and this exemption was owing to *the exclusive use of artesian water.*"—*Watson's Practice.*

The inexhaustible nature of our subject invites, but time and space forbid, the introduction of additional evidence or argument. One feature, however, of exciting interest remains, to which we must allude.

The mental and moral influence of diet, in affecting both individual character and the development of national strength, is a subject of signal importance to the agriculturist as well as to others. Just as vegetables may flourish luxuriantly and produce large crops of fruit, nevertheless of an inferior quality, so may animal intelligence and mental activity be checked, perverted, or actually depreciated. Want of proper dietetics may occasion the one as well as the other. This instructs us that while we train the mind metaphysically we should not forget the correlative physical truth: "Sana mens in sano corpore."

In the agricultural report to the Congress of the United States for 1857, D. J. Brown, on this subject, after reviewing the means of subsistence of the different nations of the globe, and comparing their intellectual conditions, concludes as follows: "That either the political and social condition of the people compel them to have recourse to the most ordinary description of food, or that the use of it tends to lower and enslave the mind, whilst a more healthful and expensive diet would have a corresponding beneficial effect. It is probable that both these causes may operate at once and upon each other. But it is nevertheless certain that the use of the most generous diet has an elevating influence upon the mind, and that in this respect the general use of wheaten bread, as the most nutritious vegetable food, in substitution for a less expensive and less wholesome one, wherever it has prevailed, has tended to elevate the character and condition of the people, and fit them for a better discharge of all the moral and social duties of life."

While our paper would be incomplete without a notice of this part of the subject, yet its length forbids further discussion at present. However, with the introduction of a matter of such extraordinary interest, we hope, in the conclusion, to excite thought and additional impulse for future study. In this connection, to help account for the mental as well as the physical differences "between the races of men, and, to ascertain extent, between man and the lower animals," we might very interestingly and profitably study and compare the theories of "natural and sexual selections, and the law of variation and transmission of character."

PREVENTION OF DISEASE, INSANITY, CRIME AND PAUPERISM.

By Nathan Allen, M.D.

Abstract of Paper read at the Conference of Charities connected with the meeting of the American Social Science Association, at Cincinnati, May 22d, 1878.

In all attempts for the removal of great evils, it is the dictate of wisdom to select those agencies which are most likely to bring about the greatest results with the least labor or sacrifice of means; in other words, to nip the evil in the bud, or to dig up and destroy its roots, rather than to lop off only its branches. A great amount of time, labor, and cost are consumed in dealing with the *effects* of evils, without reducing or removing their chief sources or primary causes. Thus, in the history of disease and insanity, while there has been an immense expenditure of labor and means to *cure* these evils, little comparatively has been done to *prevent* them. The same holds true in respect to crime and pauperism.

Great advances have been made in ascertaining the primary causes of disease, as originating in filth, bad air, impure water, foul gases, poison from decaying animal and vegetable matter, etc. It has been found, moreover, that the spread and fatality of infectious and contagious diseases can be very much controlled by isolation, by disinfectants, and by a resort to sanitary laws. To carry out these measures in a community, or extensively among a people, it becomes necessary to employ some public agency and enlist legislation for enacting laws and establishing boards of health. In this way has arisen what is called "Sanitary Legislation," or "State Medicine," the chief object of which is to *prevent disease.*

The leading agency in carrying on this work in Great Britain has been the Registrar General's department, requiring regular returns of births and deaths from every part of the kingdom, with a bureau of health connected with government. For thirty years or more, sanitary interests have been frequently discussed in Parliament; stringent laws on health have been enacted; cities and counties have been divided into districts, and an officer of health appointed to each. Instructions and reports on the subject have multiplied, together with discussions in journals and newspapers. The object of all this legislation and labor is to *prevent* disease—not cure it.

The inquiry naturally arises, What is the result, or fruit of these sanitary operations? It is not time yet to obtain the full benefits of such means; for while the advantages of observing some sanitary laws may be seen very soon, it will take many years to reap the complete benefits of others. In certain localities in Great Britain, where these laws have been only partially applied for a few

years, there has been witnessed a marked decrease in the amount of sickness and rate of mortality. From careful investigations it is estimated that this diminution will already range from one-fourth to one-third; but it is the opinion of the best judges on the subject that, when sanitary science is faithfully applied, there will be a decrease of more than one-third of the sickness and mortality which formerly occurred. The immense advantage, or value, which will be gained by this prevention of disease, in the saving of time and expense, in the prevention of pain and distress, in the general improvement of health and prolongation of life, cannot be estimated in figures or described in language. The more extensively and thoroughly these principles are applied, the greater good will they accomplish, and the more perfectly we shall find the laws of the external world adapted to the human system, showing that man has a far greater control of those laws than has generally been supposed.

Another important consideration is, that the more thoroughly sanitary agencies are applied, on a large scale, they not only serve directly to prevent disease, but furnish essential aids in curing it. Thus, the more you improve ventilation and the quality of water, drainage, and sewerage, and have regard to dietary habits and physical exercise, etc., the more successful will be the operation of all therapeutical agencies.

This sanitary movement has certain advantages over all other reforms. Its success does not depend upon the medical profession alone, nor upon government support, nor upon any one body of men, but upon all classes, both men and women. In carrying on this reform, the parties become at once partakers in its rewards—in improved health and strength; and its benefits become everywhere so manifest that the work must go on with accumulated power. What is the testimony of one of the best judges in the country on this subject? Says Dr. H. I. Bowditch, in his work, just published, upon "Public Hygiene in America": "We stand now at the very dawn of the grandest epoch yet seen in the progress of medicine. While, philosophically, accurately, and with the most minute skill studying by means of physiology, pathological anatomy, chemistry, the microscope, and, above all, by careful clinical observation, the natural history of disease and the effects of remedies, our art at the present day looks still higher, viz., *to the prevention* of as well as *to the cure* of disease. And this is to be done by sanitary organizations throughout each State—the nation, the laity, and the profession heartily joining hands in this most noble cause."

If by such means one-third or more of the sickness and the suffering consequent thereto can be averted; if the rate of mortality can be very sensibly diminished; public health everywhere greatly improved and human life prolonged, "the glorious triumphs" predicted by Dr. John Forbes, it may truly be said, "are being achieved."

The idea that insanity can be prevented may surprise some persons. It is certain that no intelligent and systematic attempts have ever been made for its general prevention. But, on the other hand,

there has been an immense expenditure of time, labor, and means to *cure* the insane.

The impression is becoming general that the multiplication of lunatic hospitals is doing but little to check insanity, and that if this evil is ever to be checked, some different means must be provided. The fact that these hospitals do not cure more of the insane, nor serve to check insanity, suggests the question whether the fault is in the nature and treatment of the disease, or in the management of these institutions. The explanation generally given is, that proper treatment was not received in its first stages. What is the testimony of experts upon the subject? Says the Superintendent of the McLean Asylum—the oldest institution in New England, and admitted to be one of the best managed in the United States—in a late report: "For the treatment of insane persons, we could wish some practice more encouraging in its remedial effects might be devised. As now administered, asylums for such unfortunates afford little more than a place where they may be isolated from society, kindly treated, and a watchful oversight maintained to prevent them from committing injury upon themselves or their attendants."

Says another expert, who was superintendent for many years over the next oldest hospital in Massachusetts: "Lunatic hospitals do not prevent insanity, because they do not by the intercourse of their officers with society at large, by their published reports, and by their general relations to the public, seek to enlighten the people on the subject of insanity—its predisposing causes, its hereditary tendencies, its relations to intemperance, poverty, and crime; and therefore they do not improve the community in this respect, except in removing from its care some of its greatest burdens."

Says another expert, who was long superintendent of one of the largest hospitals in New England, in his report: "The more we see of mental disease in its various forms, the more we are convinced that the study of its *prevention* is infinitely more important than even the study of its *cure*, and that the dissemination of more correct views of the true way of living and a more rigid observance of the laws of health and nature would greatly diminish its frequency."

What is the testimony of still higher authority on the subject? The Commissioners in Lunacy for Scotland, in a late report, state that "it is impossible to come to any other opinion than that insanity is, to a large extent, a preventable malady, and it appears to us that it is in the direction of preventing its occurrence, and not through the creation of institutions for its treatment, that any sensible diminution can be effected in its amount. Lunacy is always attended with some bodily defect, or disorder, of which it may be regarded as one of the expressions, or symptoms. We must therefore attempt to prevent its occurrence in the same way as we attempt to prevent the occurrence of what are called ordinary bodily diseases; and if it be admitted that to a large extent preventable diseases exist among us in consequence of the ignorance of the people, it is clear that we can only convert the preventable into the prevented by the removal of that ignorance through a sounder

education. In short, we can only hope that preventable diseases will be diminished in amount when the education of men is so conducted as to render them both intelligent and dutiful guardians of their own physical, intellectual, and moral health. To this, and not to any machinery, however good it may be for the treatment and care of insanity, can we reasonably look for a diminution in its amount."

Last year a select committee was appointed by Parliament to inquire into the operations of the "Lunacy Law." In the testimony given before this committee by Sir James Coxe is this statement: "That 'prevention is better than cure,' is a saying familiar to every one; but it does not seem to have been sufficiently considered that it would be possible to take measures to stop the occurrence of insanity. The fact is that we have allowed a terrible evil to grow up among us, and that we have been content to lop the branches, leaving the growth as luxuriant as ever, instead of directing our efforts to destroy it at the roots."

Sir James Coxe, in speaking of the results of hospital treatment in the cure of insanity, says only "about forty per cent. of the admissions prove recoveries." "The fact is indisputable that, as the case actually stands, asylums are places of curative treatment for only ten per cent. of their inmates, and mere places of detention or safe custody for the remaining ninety per cent." The statement here made respecting the asylums in Great Britain will apply, we fear, with equal force to the insane in this country. It is a sad thought that ninety per cent. of all the inmates of these institutions are incurable, and hence the rapid increase of chronic insanity. What a powerful argument does this fact present in favor of using all possible means for the prevention of the malady!

For the prevention of insanity, the same course must be pursued as with reference to other diseases. Ascertain its causes—diffuse information on the subject. This may be accomplished in a variety of ways: by enlisting the press; through journals and books; by family and educational training; by legislation and associated action. For illustration: If intemperance is one of the leading causes of insanity, it is high time the fact should be generally known and the warning brought home to all. If ill-health is adjudged a more fruitful source of the malady, let us understand that. If hereditary influences, in all their diversified forms, constitute another fruitful source, let us understand better the laws that regulate these influences; or if fast living or high-pressure in our educational systems are steadily swelling the ranks of the insane, the sooner these truths are brought home to the public mind the better.

Some may say that the causes of insanity are involved in so much obscurity and mystery that they cannot be found out. Fifty years ago this remark might have been made respecting a great many diseases which are now correctly understood. Let the same means be as carefully and thoroughly employed here as upon other diseases, and the causes and treatment of insanity will be far better known.

A little more than one hundred years ago, John Howard pub-

lished his celebrated work on the Prisons of England and Wales. From that period a new element entered into the treatment of prisoners. They began to be treated more like human beings, with the possibility of reformation. The principles of humanity and philanthropy, prior to that time, had scarcely been recognized in dealing with this class of persons. But during the first half-century—from 1778 to 1830—the reform made very slow progress. About this latter period commenced two great experiments in prison discipline, denominated the "congregated system," and that of "solitary confinement." These experiments created much discussion, which gave a new impulse to the reform.

The leading objects of prison discipline may be expressed under these three heads: *punishment*, *safety*, and *reform*. As to the importance of securing these three objects, all, we believe, are agreed, however they may differ in the modes of doing it, or on minor points. These objects are here placed in the order in which each has come up in history, and in accordance with the prominence which many persons seem to attach to the whole subject; but, really, reformation should be the main object of confinement and punishment, for it is more important than both of the others.

The true test of such discipline is in the proportion of prisoners discharged, improved or reformed on the one hand, and, on the other, of those released, unimproved, and perhaps made worse. If the former object was generally secured, there would be few re-committals, and far less increase of criminals. But, unfortunately, statistics show that crime is constantly increasing, that prisons of all kinds are everywhere crowded, and that nearly one-fourth of of their inmates are re-committals. It is very evident that there is something wrong in the present methods of dealing with criminals; that the ends attained do not correspond to the means employed; that *reformation* in the prisoner is not generally effected. Without attempting anything like a full discussion of the subject, we propose to notice it briefly from a single point of view, viz., *the prevention of crime.*

There are two standpoints from whence facts and arguments may be brought to show *how* crime can be prevented: First, we may check crime in criminals; and secondly, keep persons from becoming criminals.

While, in the present state of society, it may be impossible for human means to prevent some persons from entering upon a criminal career, much may be done to break up such habits when once formed, and to produce a radical change for life. It is an encouraging fact, that wherever the proper means have been brought to bear, the character of prisoners has been improved, and the number of criminals reduced. Unfortunately this part of prison discipline has been altogether underrated or neglected, while confinement and punishment have received relatively too much attention. Reform in habits and character has been considered of minor consequ nce. In fact, such has been, not unfrequently, the treatment of criminals, both in spirit and manner, as to produce anything but a reformatory influence upon them. There are laws of mind as well as of body, which, if violated, serve to make the individual

more of a criminal. Let the animal and selfish nature in the prisoner be mainly exercised, without developing his moral and intellectual powers, and no reformation in his habits or character takes place or can be expected. As this treatment of prisoners involves laws which lie at the foundation of all reform, and, of course, of correcting criminal habits, it should receive the most scrupulous attention. The criminal is a human being and governed by law. Crime is a violation of law—not merely civil, but moral—a law of nature. The criminal has all the faculties of other persons, but not well-balanced or properly enlightened and trained. While the safety of the community and the principles of justice require that the criminal should be confined and punished, it should be done in harmony with *laws which develop his higher and better nature.* No criminal was ever reformed by being treated in a brutish manner, nor by appeals only to his animal and selfish nature. The conscience must be enlightened, and the intellect instructed. Hence, educational, moral, and religious influences ought to be brought into requisition far more than they are. No prisoner should ever be discharged without being improved, if possible, in his habits and character. This reform must be an individual work —the treatment varied or adapted to every case. Reform seldom, if ever, occurs in classes or large numbers at once. Such a work requires time, labor, and means; but its results will abundantly pay.

It is in this respect that prison discipline fails—its subject is not reformed, neither is crime checked. It is in this direction that improvements should be made, which would have a powerful influence in the prevention of crime.

The most important reform in prison discipline that has anywhere occurred is in Ireland. This is based upon a system of improved classification of rewards and promotions, as well as of encouragement and assistance to prisoners after being released. This reform commenced some thirty-five years ago, and has resulted in a great decrease of crime, as well as of the number of convicts. Improvements of a similar character have been introduced into the English prisons, and have been attended with decidedly beneficial results.

We regret that we cannot report favorably in this respect of prison discipline in our own country. Since the Civil War crime has everywhere rapidly increased, and in some States it is estimated that it has doubled. No thorough and systematic measures are taken to reform prisoners; the old ranks are kept good, and new recruits are constantly being added. Great pains are taken to provide prisoners with labor, to make contracts, and to obtain as much money as possible out of their work. If we had the same amount of effort expended in reforming their habits and character, crime and criminals would decrease.

The second means of preventing crime, viz., keeping persons from becoming criminals, opens up a very important field of inquiry. All history proves that the criminal class, as a body, originate from a peculiar stratum or type in society—sometimes from the middle or common walks of life, but more generally from the lowest orders, especially from the ignorant, the shiftless, the indolent,

and dissipated. Occasionally we find some from high life, from those in good circumstances, from well-trained families, from good homes. But these are altogether the exceptions. In such cases, any new or additional means to reform them would be comparatively useless. If our object, then, is to prevent crime on a large scale, we must direct attention to its main sources—to the materials that make criminals; the springs must be dried up; the supplies must be cut off. This fruitful source, or fountain-head of crime, is found among children of poor or miserable parentage, surrounded by bad influences and exposed to all manner of temptation, with no one disposed or qualified to train and educate them. Such are the hot-beds of vice and crime. On account of indolent, shiftless, and dissipated habits, such people continue poor and dependent; the children stray away from their homes, large numbers also become orphans and fall upon the public for support, or become pests to society. All such children should be picked up and gathered into reformatories, or find homes in good private families, which are the best reformatory institutions in the world.

Again: in such low communities, abounding with children, and where the children are not separated from their parents, compulsory education should be enforced; the State or municipality should see to it that every child is brought into the public school and educated. Efforts in various other ways should be used to bring moral and religious influences to bear upon such families and neighborhoods. Children become vicious and criminal frequently on account of their surroundings and immediate exposures. The sooner children can be removed from such circumstances the better. The public are not sufficiently awake to these upas-trees of poison, these pests and hot-houses of vice. All legal and moral means should be employed to reform such classes. Every State and city should adopt systematic measures for this purpose. The saving in taxation alone will pay for it. In no other way can crime be so effectually prevented.

More prolific than any other in the production of crime is the vice of intemperance. This operates in so many ways that it is impossible to trace out all its pernicious effects. It impoverishes people and brings them into circumstances of temptation; it corrupts the morals and poisons the blood; it excites the evil propensities and develops the animal nature; it stupefies conscience and destroys the moral sentiments; it impairs in man the powers of free agency, and converts him into a brute. Whatever produces such effects upon the human system must have a powerful influence in the production of crime. The evidences come from all quarters (and without contradiction from any) that intemperance is the cause or occasion of three-fourths of all the crime committed —some estimating it even higher. The habit commences early and more readily with individuals and families who are predisposed to idleness and to a low, animal life. The natural instincts of such persons flow in one direction, and drinking becomes a master-passion. If intoxicating drinks can be withheld from this class of persons, their habits and character become gradually improved. Total abstinence would do much to save them from a life of vice

and crime. By this means more than half of the crime committed would be prevented.

In our attempts to prevent pauperism, it becomes us to inquire *where*, *how*, and *by what means* it can be best done. Like some other evils, it is very difficult to eradicate or check when once started. When an individual once becomes a pauper, he loses that pride and self-respect which have kept him a long time from a position of want and dependence. Then, such are the associations and influences that surround this class of persons, that when they once become paupers, it is *for life*. Only occasionally, by the help of some friend or fortunate circumstance, the inmate of an almshouse gets away from the establishment and finds a support elsewhere, and never returns. Again, sometimes by improvement in health, or the assistance of friends, paupers leave an almshouse for a season, but when their means fail they return to their old quarters. There is still another class of paupers, who for various reasons get out of an almshouse, thinking they can and shall in some way take care of themselves, but who, by their indolent and dissipated habits, soon come to want and are returned to the almshouse. So powerful are the influences forcing the pauper downward that he seldom becomes self-supporting.

Thus, in the prevention of pauperism, very little can be done in reclaiming those once paupers and making them permanently self-supporting.

Ignorance has always been considered a leading cause of pauperism. In a careful examination lately of some ten thousand paupers over sixteen years of age, in the city and country almshouses of the State of New York, it was found that 32 per cent. could neither read nor write; 14½ per cent. could read only, and 24 per cent. read and write, while 29½ per cent. had received a fair common-school education. The last class—comprising less than one-third of the ten thousand—is the only portion whose education could be considered of much service in enabling them to take care of themselves.

Intemperance is a fruitful source of pauperism. In the ten thousand paupers examined in the almshouses of the State of New York, almost four thousand males and a little over two thousand females were found of intemperate habits, making 62½ per cent. of the whole. The same line of inquiry was extended to the parents of the twelve thousand paupers in these almshouses; and though nothing definite could be ascertained in respect to large numbers, yet more than four thousand of the fathers and mothers were found to have been intemperate. This fact shows that the law of inheritance may have a powerful agency in the production of pauperism.

It is presumed the same proportion of ignorance and intemperance found in New York will apply to the paupers in other States. In Massachusetts, attempts have been made by its Boards of Health and State Charities to ascertain, through overseers of the poor, just how far intemperance was the cause of pauperism. The results of these inquiries cannot be given in figures, but in the opinion or testimony of the best judges on the subject. The report from Boston says about 80 per cent.; from the other cities in the State,

from 50 to 70 per cent.; and in country towns, from 30 to 60 per cent. In the larger institutions—the State prison, almshouse, and workhouse—the estimate is 75 per cent., and in the lunatic hospitals, confining the estimate to the class who become paupers, the per cent. must range from 20 to 30, and perhaps higher. The average estimate for the whole State must be about 67 per cent. Thus intemperance is the cause of two-thirds of the pauperism in Massachusetts.

In making this statement there should be some qualification, by saying that intemperance may not be the sole or exclusive cause. It is sometimes very difficult to separate cause and effect. We may have idleness, poverty, and dissipation, each aggravating the other; but, after all, the latter is by far the most active and powerful. Intemperance is therefore called the cause, the chief cause, the occasion, of pauperism, as the other agents alone would never bring about such a result.

But ignorance and intemperance are not the only causes of pauperism. Indolence, improvidence, and licentiousness contribute also their share. These vices very generally go together and enter early into the habits and character of children. Such influences beget paupers; they are the materials that make them. Wherever individuals, families, and neighborhoods are slaves of these vices, pauperism has its strongest foothold and will rapidly increase.

One of the most encouraging agencies for preventing pauperism is a wise provision for poor children. The gathering up of homeless and orphan children, and removing all found in almshouses—placing them in schools and finding homes for them in private families—is doing much to prevent pauperism. Within a few years, Massachusetts and New York, by legislation and other means, have nobly taken hold of this work, and immense good is being accomplished. Let this reformatory movement be vigorously carried on for a series of years, and it cannot fail to prevent a large amount of pauperism.

Disease, in all its diversified forms and attendant consequences, is productive of more pauperism, probably, than any other one cause. It is not the disease so much found in hospitals and public institutions as that everywhere scattered in the common walks of life, and especially in the lower orders of society. Sanitary measures and boards of health will, in the course of time, do a noble work in the prevention of pauperism; but if, then, the hereditary diseases which are generally more prevalent in that class of the community most likely to become paupers could be prevented or abridged, it would save an untold amount of pauperism—especially in the course of two or three generations.

If this prevention of disease, or improvement in hereditary agencies, could be extended to the defective classes—to the idiotic and feeble-minded, to the deaf and dumb, to the blind and the insane—it would make a notable difference in the amount of pauperism. The cause of our finding so large a number of paupers in these defective classes is violated physical laws, either on the part of the individuals themselves or their ancestors. While we cannot determine just what proportion of these evils are of hereditary

origin, nor point out exactly the line of causation in their production, there is no question but that a great deal can be done by proper means, towards preventing them.

In closing this paper, it is unnecessary to enlarge upon the magnitude of the evils here mentioned. Our aim has been to adhere strictly to a line of thought, fact, and argument which is practical and commends itself to the common-sense, as well as intelligence of the community. The indications are marked that, in the treatment of disease, certain agencies have been set in motion which must result in a great reform. If the next twenty years shall witness as much improvement as the past, there will be found at the close of this century a marked diminution of disease, as well as improved rate of mortality and prolongation of human life. The principles of physiology and hygiene in their bearings on health will become far better understood, enabling individuals to take better care of themselves and to ward off the first approaches of disease. As about one-third of all insanity can be traced to hereditary sources, the general improvement of the constitution and health of a people will go far to prevent insanity; and in case persons become insane, this same knowledge will afford essential help in its treatment.

It may be said, that while this improvement in physical organization and extension of knowledge may serve to prevent disease and insanity, its effects in diminishing crime and pauperism cannot be very marked. But in time (it may take two or three generations) such a reform must reach the criminal and the pauper. Improve physical organization and diffuse practical knowedge concerning it—and the number of criminals and paupers must be diminished. It cannot be otherwise. Improvements, based upon the principles of science and involving the highest welfare of man, never go backward nor remain stationary. Such reforms, once started, must go forward.

A distinguished statesman, in the immediate prospect of death, once expressed the desire that, if it were possible, he might live fifty years more to see certain reforms in government. So the philanthropist, in forecasting the future, may well express the wish to live another half-century, to witness the great improvements in society arising from the unfolding of physical laws and the applications of science.

What is Heat Lightning?—The flashes of lightning often observed on a summer evening, unaccompanied by thunder, and popularly known as "heat lightning," are merely the light from discharges of electricity from an ordinary thunder-cloud, beneath the horizon of the observer, reflected from clouds, or perhaps from the air itself, as in the cases of twilight. Mr. Brooks, one of the directors of the telegraph line between Pittsburgh and Philadelphia, informs us that on one occasion, to satisfy himself on this point, he asked for information from a distant operator during appearance of flashes of this kind in the distant horizon, and learned that they proceeded from a thunder-storm then raging two hundred and fifty miles eastward of his place of observation. —*Prof. Henry.*

"DOCTORS."

In view of the extraordinary popularity of the medical profession in the United States—about two thousand being graduated annually by the medical schools—it is perhaps not surprising that there should be some "natural born," illustrations alike of excessive faith in hereditary qualities and in mountebanks. The following are examples:

Borned Doctors.—At a meeting of the Senate Committee on Public Health to consider the bill "to regulate the practice of medicine and surgery," before the recent session of the New York Legislature, Dr. H. A. Benton, an electric doctor of Troy, denounced the bill. He said that he had practised twenty-nine years without a diploma, and that there were thousands of younger men doing good in healing the sick in the same way. This bill would make such persons criminals, and prevent the accomplishment of much good through electricity and like modes of healing, mostly employed by irregular physicians.

Dr. Fish, a magnetic doctor of Albany, magnetized the audience by a most extraordinary address, in the course of which he recited the greater portion of the Constitution of the United States, the Bill of Rights, and the Resolutions of '98. He declared that physicians, like poets, must be born, not made, and that regular doctors killed more than they cured, and should be extirpated. The true doctor was one who was inspired by a knowledge of his own inherent powers, and made his patients believe in him. This did not seem to be the case with the committee of one on this occasion, for Senator Pierce's involuntary hilarity, and the ill-suppressed laughter of the audience, uncontrollable even by the gravity of the subject, compelled an adjournment.

A Fish of another Color.—Some years ago one Morris Taylor was brought before a Recorder's Court, in Texas, accused of having administered poison to Mary Ann Tolden in a glass of soda-water. Dr. Thomas Fish, a colored "ge'man," was called to the stand as a witness for the State. The doctor was a small-sized individual, slip-shod, walked with a cane, had a small head, scant of wool, Solferino eyes, mouth cut biased, and the look of one who had an eye to the main chance.

The doctor hobbled up to the stand and proceeded to answer the questions put to him by the Court, thusly:

By the Court—What is your name?

Dr. F.—Dr. Thomas Fish.

Court—What is your trade? What do you do for a living?

Dr. F.—Ise a doctor—er fissian (physician).

Court—Under what school of medicine did you study?

Dr. F.—Hey! Didn't study 't all. Cum into de wurl a doctor. Was borned a doctor. You see, boss, I cures people wid dis yere

han', dis yere right han'. I jes puts it on 'em, and does a little summen to 'em, and dey gits well; I does. I was worth more ter my old masser dan all the oder niggers he had. Ise a doctor, I is. (Here the witness surveyed the audience with a great deal of gravity and importance, hitched up his pants, and turned again to the Court.)

Court—Do you know Mary Ann Tolden? If you do, state what was her condition when you saw her Sunday or Monday last.

Dr. F.—I knows her. Well, boss, you know, last Sunday or Monday, I disremember which, I was called in 'fessionally to see de young lady. I found her in 'vulsions and 'plaining of things, wurrien 'bout her heart. Says I, "Mary Ann, what's de matter?" Says she, "Doctor, I feel things wurkin' round my heart." I put dis yere right han' on her and she got still. I saw her sorter swelled out, and felt things a wurkin' round in dere, and I knowed she mus' have sum varmint in dere. So I give a tablespoonful of fresh milk, and den I took a speckled chicken—a real natural chicken—and cut it open and put it on her right side, jes' over whar the heart beats. I kep' it dere for some time, maybe half-hour. De treatment fotched 'em out; cured her up.

Court—Have you a license to practise medicine?

Dr. F.—Yes, sir! (Here witness produced a city license signed by the Mayor, authorizing him to carry on the occupation of a physician.)

Court—Can you read?

Dr. F.—No, sir; I don't need ter. I'se de sebenth son of de sebenth son. My nollige was born wid me.

Court—Have you a license from the County Board of Physicians?

Dr. F.—No, sir! What for I want to go to dem for? Ise a doctor, I is. I cures people wid my han'—my right han'. I don't give no doctor stuff. (Here witness looked disgusted, as though to insinuate that to go before the common board were a great insult.)

Court—Do you get pay for your visits and doctoring?

Dr. F.—Pay? pay? In course I does. Ise no fool, I aint. I'm a doctor, I is. Course I gets pay. I charges 'em $25 for every case, and I make 'em pay me, I does. Ise a doctor, I is.

Homœopathic Doctors.—Professor Joseph G. Richardson, University of Pennsylvania, in a recent lecture on Medical Scepticism and Superstition, gives the following authorized formula for preparing homœopathic medicines:

Take one drop of the mother tincture, for example, tincture of aconite, and shake it with ninety-nine drops of alcohol, thus producing the first dilution or first potency; next take one drop of this diluted tincture (of the strength of one per cent.) and shake it with another ninety-nine drops of alcohol, giving us the second dilution of potency; which you observe is of a strength, or rather weakness, equivalent to one drop of the original tincture in ten thousand drops of pure alcohol. The third dilution is obtained by a repetition of the same process, and so on indefinitely, the twenty-fourth dilution having, according to the late Professor James Simpson, a strength equal to one grain of the original drug, dis-

solve in an ocean of fourteen quintillion cubic miles of alcohol, or a quantity sufficient to make one hundred and forty masses, each extending from limit to limit of the planet Neptune's orbit . . . The fifth dilution has a strength about equal to one grain (of morphia, for example) dissolved in five thousand barrels of alcohol. Since the solution of one drop of concentrated prussic acid, probably one of the deadliest poisons known, to a single barrel of fluid, could be taken with impunity in doses of a quart or more, there is no doubt that this fifth centesimal dilution of aconite, belladonna, nux vomica, or any other homœopathic remedy, being, as just stated, a mixture in the proportion of one grain or drop to about five thousand barrels of alcohol, may be looked upon as a preëminently safe preparation.

"Regular" Doctors.—*To the Editor of* THE SANITARIAN: Happening in recently at one of the leading druggists of Brooklyn, I was appealed to for suggestions how to compound *nicely* two prescriptions just received, made by a member of the Kings County Medical Society. I could not aid him, but by his permission I copied the prescriptions, that I might inquire of others, and I send the copy to you, not alone as a druggist's puzzle, but as a conundrum: whether the poor patients who had to swallow the potions, or the doctor who prescribed them, is most deserving of pity?

Brooklyn, April 24, 1878.

℞

Potass. brom., gr. xxxvj.
Mixt. cretæ ad., ʒ iij.
Solut. arsenical Fowleri, gtt. xxxv.
Tinc. op. camph., ʒ iv.
Spt. chloroform, gtt. xxxv.
Vin. ipecac., ʒ ij.
Bism. subnitr., ʒ j.
Tinc. kino, ʒ iij.
Sod. bicarbon., gr. xxxvj.
Tinc. rhei, ʒ j.
Ol. ricini., gtt. l.
Tinc. capsic., gtt. xij.
Pepsin., sacch., āā gr. l.
Syr. acaciae, ʒ ss.

M. S.—One teaspoonful three to four times a day.

℞

Solut. ars. Fowleri, gtt. xlv.
Tinc. op. deodor., ʒ ss.
Bism. subnitr., ʒ j.
Extr. fl. ipec., gtt. xij.
Tinc. rhei. dulc., ʒ ij.
Tinc. belladon., gtt. l.
Extr. fl. Colombo, ʒ ij.
Tinc. gent. comp., ʒ ss.
Pepsini, ʒ j.
Catechu., gr. xxxvj.
Syr. acac., ʒ iij.
Mixt. cretae ad., ʒ iij.

S.—One teaspoonful after each passage.

Diagnosis.—A friar once met some medical students, who asked him, "Do you know the difference between a friar and a jackass? Give it up?" "Yes, I give it up." "Well," said they, "one wears a cross on his breast and the other on his back." "Now," said the friar, "do you know the difference between a medical student and a jackass? Give it up?" "Yes, we give it up; we don't know the difference." "Neither do I," said the friar.

STATE BOARDS OF HEALTH.

Connecticut.—The medical profession in Connecticut is to be congratulated on the final success of its efforts in the enactment of the following law, establishing a State Board of Health:

GENERAL ASSEMBLY, JANUARY SESSION, A. D. 1878.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

Section 1. That the Governor, by and with the advice and consent of the Senate, shall appoint six persons, three of whom shall always be physicians, and one lawyer, who, together with a secretary to be elected by them, shall constitute the State Board of Health. Of the six persons first appointed, two shall serve for two years, two for four years, and two for six years, from the first day of —— next following their confirmation, and the Governor shall hereafter biennially appoint, by and with the advice and consent of the Senate, two members of said State Board of Health, to hold their offices for six years from the first day of —— next following their confirmation. If a vacancy occur in said board during a recess of the legislature it shall be filled by the Governor until the next regular session of the same.

Sec. 2. That the State Board of Health shall meet at least once in every three months, and as much oftener as they may deem proper. Four members shall always constitute a quorum for business. No member of the board shall receive any compensation except the Secretary, but the actual travelling and other expenses of the members while engaged in the duties of the board shall be allowed and paid out of the appropriation made for its support. They shall select annually one member of the board as President, and shall appoint a suitable person, who shall be a physician, to be their permanent secretary and executive officer, who shall hold his office so long as he shall faithfully discharge the duties thereof, but who may be removed for cause at any meeting of the board, a majority of the members voting therefor. If a member of the board be elected as Secretary, the vacancy thus caused shall be filled by the Governor, as provided in section first.

Sec. 3. That the Secretary shall keep a record of the acts and proceedings of the board, perform and superintend the work prescribed in this act, and such other duties as the board may order under their general direction, and shall receive an annual salary of ——, which shall be paid him in the same manner as the salaries of other State officers are paid, and such necessary expenses as the comptroller of the treasury shall audit, on the presentation of an itemized account, with vouchers annexed, and the certificate of the board shall be allowed him.

Sec. 4. That the said State Board of Health shall take cognizance of the interests of health and life among the people of this State; they shall make sanitary investigations and inquire respecting the causes of disease, and especially of epidemics, the sources of mortality, and the effects of localities, employments, conditions, *ingesta*, habits, and other circumstances upon the public health; and they shall collect such information in respect of these matters

as may be useful in the discharge of their duties, and contribute to the promotion of health and the security of life in this State; they shall cause to be made by their secretary or by a committee of the board, inspections at such times as they may deem best, and whenever directed by the Governor or the Legislature, of all public hospitals, prisons, asylums, or other public institutions, in regard to the location, drainage, water supply, disposal of *excreta*, heating and ventilation, and other circumstances in any way affecting the health of their inmates, and shall also suggest such remedies as they may consider suitable for the removal of all conditions detrimental to health in the said institutions, in writing, to the officers thereof.

Sec. 5. That the said board shall cause all proper sanitary information in its possession to be promptly forwarded to the local health authorities of any city, village, town or county in this State, which may request the same, adding thereto such useful suggestions as the experience of said board may supply. And it is also hereby made the duty of said local health authorities to supply the like information and suggestions to said State Board of Health, together with a copy of all their reports and other publications. And said Board of Health is authorized to require reports and information (at such times and of such facts, and generally of such nature and extent, relating to the safety of life and promotion of health, as its by-laws or rules may provide) from all public dispensaries, hospitals, asylums, infirmaries, prisons, and schools, and from the managers, principals, and officers thereof; and from all other public institutions, their officers and managers, and from the proprietors, managers, lessees, and occupants of all places of public resort in the State; but such reports and information shall only be required concerning matters or particulars in respect of which it may in its opinion need information for the proper discharge of its duties. Said board shall, when requested by public authorities, or when they deem it best, advise officers of the State, county, or local government in regard to sanitary drainage, and the location, drainage, ventilation, and sanitary provisions of any public institution, building, or public place.

Sec. 6. That it shall be the duty of the State Board to give all information that may be reasonably requested, concerning any threatened danger to the public health, to the local health officers, and all other sanitary authorities in the State, who shall give the like information to said board; and said board and said officers, and said sanitary authorities shall, so far as legal and practicable, coöperate together to prevent the spread of disease, and for the protection of life and the promotion of health, within the sphere of their respective duties.

Sec. 7. That said board may, from time to time, engage suitable persons to render sanitary service and to make or supervise practical and scientific investigations and examinations requiring expert skill, and to prepare plans and reports relative thereto. And it is hereby made the duty of all boards and agents, having the control, charge, or custody of any public structure, work, ground, or erection, or any plan, description, outlines, drawings, or charts thereof, or relating thereto, made, kept, or controlled under any public

authority, to permit and facilitate the examination and inspection, and the making of copies of the same by any officer or person by said board authorized; and the members of said board, and such other officer or person as may at any time be by said board authorized, may, without fee or hindrance, enter, examine, and survey all such grounds, erections, vehicles, structures, apartments, buildings, and places.

Sec. 8. That it shall be the duty of the State Board of Health to have the general supervision of the State system of registration of births, marriages, and deaths. Said board shall prepare the necessary methods and forms for obtaining and preserving such records, and to insure the faithful registration of the same in the several counties, and in the central bureau of vital statistics at the capital of the State. The said board of health shall recommend such forms and amendments of law as shall be deemed to be necessary for the thorough organization and efficiency of the registration of vital statistics throughout the State. The secretary of said board of health shall be the superintendent of registration of vital statistics. As supervised by the said board, the clerical duties and safe keeping of the bureau of vital statistics thus created shall be provided for by the comptroller of the State, who shall also provide and furnish such apartments and stationery as said board shall require in the discharge of its duties.

Sec. 9. That the said board, on or before the first day of —— in each year, shall make a report in writing to the Governor, upon the vital statistics and the sanitary condition and prospects of the State, which report shall also set forth the action of said board, and its officers and agents, and the names thereof for the past year, and shall contain a full statement of their acts, investigations, and discoveries, with such suggestions for further legislative action or other precautions as they may deem proper for the better protection of life and health. This report shall also contain a detailed statement of the moneys expended by said board, and the manner of their expenditure the year for which it is made; but the total amount paid for the expenses of this board, including the salary and expenses of the Secretary, shall not exceed ——, which amount is hereby annually appropriated for this purpose, to be paid by the treasurer, on the comptroller's warrant, in such sums as the certificate of the board, with proper vouchers annexed, may certify from time to time.

Sec. 10. That this act shall take effect from the date of its passage; and that all acts or parts of acts inconsistent herewith, be, and the same are, hereby repealed.

The Governor has appointed the following members of the Board:

J. S. Butler, M.D., of Hartford, for many years superintendent of the Retreat for the Insane; A. E. Burr, editor of the Hartford *Times;* Prof. E. A. Lindsley, M.D., and Prof. W. H. Brewer, of the Yale Scientific School; Robert Hubbard, M.D., of Bridgeport, and A. C. Lippitt, Esq., of New London. The Board has organized by electing Dr. Butler president, and Dr. C. W. Chamberlain, of Hartford, permanent secretary; and appointed the following

Committees: Mr. Burr and Prof. Brewer on the Protection of Buildings from the Gases of Decay; Prof. Lindsley and Dr. Chamberlain on Vital Statistics; Dr. Butler on State Preventive Medicine; Prof. Brewer on the Pollution of Streams and Water Supply; Mr. Lippitt on Sanitary Legislation; Drs. S. Hubbard and Chamberlain, on Epidemic, Endemic, and Contagious Diseases; the President and Secretary on By-laws and Regulations. Plans have been formed for securing regular correspondents among, and the active coöperation of, the medical profession throughout the State. Altogether, the organization and the plans of the Board are alike auspicious for much useful work.

Kentucky.—A Bill Creating the State Board of Health—1878—as follows:

Section 1. *Be it enacted by the General Assembly of the Commonwealth of Kentucky*, That a board is hereby established which shall be known under the name and style of the "State Board of Health." It shall consist of seven members, as follows: Six members, who shall be appointed by the Governor, with the consent of the Senate, and a Secretary, as provided in section 4 of this act. The six members first appointed shall be so designated by the Governor that the term of office of two shall expire every two years, on April 1; thereafter the Governor, with consent of the Senate shall biennially appoint two members, to hold their office for six years, ending April 1. Any vacancy in said board may be filled, until the next regular session of the Legislature, by the Governor.

Sec. 2. The State Board of Health shall have the general supervision of the interests of the health and life of the citizens of this State; shall study the vital statistics of this State, and endeavor to make intelligent and profitable use of the collected records of deaths and sickness among the people; they shall make sanitary investigations and inquiries respecting the cause of disease, and especially of epidemics; the causes of mortality, and the effects of localities, employment, conditions of food, water supply, habits, and circumstances on the health of the people. They shall, when required, or when they deem it best, advise with officers of the government, or with other State boards, in regard to the location, drainage, water supply, disposal of *excreta*, heating and ventilation of any public institution or building. They shall, from time to time, recommend standard works on the subject of hygiene for the use of the schools of the State.

Sec. 3. The board shall meet semi-annually at Frankfort, and at such other places and time as they may deem expedient. A majority shall be a quorum for the transaction of business. They shall choose one of their number to be their President, and may adopt rules and by-laws, subject to the provisions of this act. They shall have authority to send their Secretary, or a committee of the board, to any part of the State, when deemed necessary, to investigate the causes of any special or unusual disease or mortality.

Sec. 4. At their first meeting the board shall elect a Secretary, who shall, by virtue of such election, become a member of the board, and its executive officer. The board may elect one of their own number Secretary, in which case the Governor shall appoint another member to complete the full number of the board.

Sec. 5. The Secretary shall hold his office so long as he shall faithfully discharge the duties thereof, but may be removed, for just cause, at a regular meeting of the board, a majority of the members voting therefor. He shall keep his office at Frankfort, and shall perform the duties prescribed by this act or required by the board. He shall keep a record of the transactions of the board; shall have the custody of all books, papers, documents, and other property belonging to the board, which may be deposited in his office; shall, so far as practicable, communicate with other State Boards of Health, and with the local boards within his State; shall keep on file all reports received from such boards, and all correspondence of the office appertaining to the business of the board. He shall, so far as possible, aid in obtaining contributions to the library of the board. He shall prepare blank forms of returns, and such instructions as may be necessary, and forward them to the local boards throughout the State. He shall collect information concerning vital statistics, knowledge respecting diseases, and all useful information on the subject of hygiene, and through an annual report and otherwise, as the board may direct, disseminate such information among the people. Also, he shall supply, on demand, to the local Boards of Health, reliable vaccine virus for the gratuitous vaccination of the poor.

Sec. 6. The Secretary shall receive an annual salary, which shall be fixed by the State Board of Health. The board shall quarterly certify the amount due him, and on presentation of said certificate, the Auditor shall draw his warrant upon the Treasurer for the amount. The members of the board shall receive no per diem compensation for their services, but their travelling and other necessary expenses while employed on the business of the board shall be allowed and paid.

Sec. 7. The sum of twenty-five hundred dollars per annum, or so much thereof as may be deemed necessary by the State Board of Health, is hereby appropriated to pay the salary of the Secretary, meet the contingent expenses of the office of the Secretary, and the expenses of the board, which shall not exceed the sum hereby appropriated. Said expenses shall be certified and paid in the same manner as the salary of the Secretary.

Sec. 8. It shall be the duty of each County Court to appoint, for their respective counties, a local Board of Health, which board shall consist of three members, one of whom must be a practising physician in good standing.

Sec. 9. The local boards shall make such regulations respecting nuisances, sources of filth, the disposal of infected clothing, etc., and the removal of the causes of disease generally, as they shall judge necessary for the public health and safety. They shall make a special report to the State Board of Health whenever they deem it expedient, or when required by the State Board so to do.

Sec. 10. The Secretary of the State Board of Health shall be the Superintendent of Vital Statistics. Under the general direction of the Auditor he shall collect these statistics and prepare and publish the report required by law, relating to births, marriages, and deaths.

Sec. 11. The State Librarian shall provide a suitable room for the meetings of the board at Frankfort, and office room for its Secretary.

The board has been organized by the appointment of Drs. Lunsford P. Yandell, Richard Curd Thomas, Pinckney Thompson, R. W. Dunlap, William B. Rodman, and James Shackelford.

Diseases of the Ear from Bathing.—The ear is far oftener the seat of inflammation and resulting deafness from bathing than is generally supposed. Although its delicate parts occupy a deep situation in the skull, which is usually a protection from objects capable of injuring it, yet in any bathing which includes immersion of the head it is liable to be more or less damaged.

This damage consists in the admission of the water to the ear, either through the external auditory canal or the Eustachian tube. When water finds admittance to the former, if cold or salt, inflammation of the meatus alone may result; or if violently injected, as in surf-bathing, or long retained in the canal from diving, the disease may affect the drum-head and middle ear.

Whenever water is forced from the mouth and nostrils into the middle ear through the Eustachian tube, inflammation of the middle ear is almost sure to occur, even though the water be warm. This has been frequently illustrated in a most painful manner by those who have been induced to use the popular nasal douche, inflammation of an acute purulent character having frequently been thus established, which has been dangerous to the life of the patient, and after a tedious recovery left great deafness behind.

Frequent exposures, especially in salt-water bathing, may be the cause of slight earaches, which are usually neglected as unimportant, but which are frequently the precursors of much deafness.

The fact that several thousand severe cases of aural disease thus result annually in New York City alone should be a serious admonition to all who are concerned, and that three of the sixty-five cases here reported had dangerous cerebral complications should be a further warning.

That bathing is pleasant and healthful is of course admitted, but that it cannot be practised as at present without danger is undeniable. It has been shown by a glance at natural history that amphibia, whose life is passed indifferently in air or water, have naturally the means of protecting their auditory apparatus; but man is not so constructed, and therefore he cannot with safety practise diving or submerging the head. He should never dive if he wishes to preserve his hearing.

When in the surf he should take the water upon his chest or back, closing the mouth and nostrils, being careful not to present the ear to the incoming wave. It is equally dangerous while swimming to receive the dashing water into the mouth or nostrils. A firm pledget of cotton-wool in the ears is some protection. Drying the hair and body, and dressing quickly after the bath are, of course, necessary precautions.—Samuel Sexton, M.D., Surgeon-in-Chief to the New York Ear Dispensary; Aural Surgeon to the New York Eye and Ear Infirmary, etc., in *The Medical Record*, May 4, 1878.

NATIONAL QUARANTINE.

An Act to prevent the introduction of contagious or infectious diseases into the United States:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That no vessel or vehicle coming from any foreign port or country where any contagious or infectious disease may exist, and no vessel or vehicle conveying any person or persons, merchandise, or animals, affected with infectious or contagious disease, shall enter into any port of the United States or pass the boundary line between the United States and any foreign country, contrary to the quarantine laws of any one of the said United States, into or through the jurisdiction of which said vessel or vehicle may pass, or to which it is destined, except in the manner and subject to the regulations to be prescribed as hereinafter provided.

Sec. 2. That whenever any infectious or contagious disease shall appear in any foreign port or country, and whenever any vessel shall leave any infected foreign port, or, having on board goods or passengers coming from any place or district infected with cholera or yellow fever, shall leave any foreign port, bound for any port in the United States, the consular officer, or other representative of the United States at or nearest such foreign port, shall immediately give information thereof to the Supervising Surgeon-General of the Marine Hospital Service, and shall report to him the name, the date of departure, and the port of destination of said vessel; and shall also make the same report to the health officer of the port of destination in the United States; and the consular officers of the United States shall make weekly reports to him of the sanitary condition of the ports at which they are respectively stationed; and the said Surgeon-General of the Marine Hospital Service shall, under the direction of the Secretary of the Treasury, be charged with the execution of the provisions of this act, and shall frame all needful rules and regulations for that purpose, which rules and regulations shall be subject to the approval of the President; but such rules and regulations shall not conflict with or impair any sanitary or quarantine laws or regulations of any State or municipal authorities now existing, or which may hereafter be enacted.

Sec. 3. That it shall be the duty of the medical officers of the Marine Hospital Service, and of customs officers, to aid in the enforcement of the national quarantine rules and regulations established under the preceding section; but no additional compensation shall be allowed said officers by reason of such services as they may be required to perform under this act, except actual and necessary travelling expenses.

Sec. 4. That the Surgeon-General of the Marine Hospital Service shall, upon receipt of information of the departure of any

vessel, goods, or passengers from infected places to any port in the United States, immediately notify the proper State or municipal and United States officer or officers at the threatened port of destination of the vessel, and shall prepare and transmit to the medical officers of the Marine Hospital Service, to collectors of customs, and to the State and municipal health authorities in the United States, weekly abstracts of the consular sanitary reports and other pertinent information received by him.

Sec. 5. That wherever, at any port of the United States, any State or municipal quarantine system may now or may hereafter exist, the officers or agents of such system shall, upon the application of the respective State or municipal authorities, be authorized and empowered to act as officers or agents of the national quarantine system, and shall be clothed with all the powers of United States officers for quarantine purposes, but shall receive no pay or emoluments from the United States. At all other ports where, in the opinion of the Secretary of the Treasury, it shall be deemed necessary to establish quarantine, the medical officers or other agents of the Marine Hospital Service shall perform such duties in the enforcement of the quarantine rules and regulations as may be assigned them by the Surgeon-General of that service under this act: *Provided*, that there shall be no interference in any manner with any quarantine laws or regulations as they now exist, or may hereafter be adopted, under State laws.

Sec. 6. That all acts or parts of acts inconsistent with this act be and the same are hereby repealed.

In view of the inefficiency of the quarantine regulations at several ports of the United States hitherto, and in consideration of the special provision, "*that there shall be no interference in any manner with any quarantine laws or regulations as they now exist, or may hereafter be adopted under State laws*," this act may be regarded as one of much promise in preventing the introduction of epidemic diseases by commerce, and extending the usefulness of the Marine Hospital Service. And in this view we regard the law as excellent, and heartily endorse the remarks of our esteemed contemporary, *The American Medical Bi-weekly:* "It is not as absolute or thorough as might be desired, but when the spirit of concession to the rights of States and cities pervading the law is considered, every one must admit that the framers of the law have done exceedingly well, and are justly entitled to most generous commendation. The only fear is that, from a desire not to interfere with State or municipal laws now existing, this new quarantine law may, by those charged with its execution, be occasionally inoperative or inefficient.

"As to the necessity of the law, none but those wedded to their idols, which they have blindly bowed down to and foolishly worshipped, can entertain a doubt. Cholera and yellow fever have desolated this country, ruining its commerce, filling its cemeteries, and bringing widespread anguish to its people. They are imported diseases. The case has been tried; the evidence is in; and science, through its votaries, has given its verdict. To prevent them is possible only by a thorough quarantine"—*and civic cleanliness.*

JEWISH MODE OF SLAUGHTERING ANIMALS.

The method proposed by those hostile to the Jewish mode of slaughtering animals may be termed "shock to the brain." Before considering it in detail, it were well to make some preliminary observations. In the first place, what are signs whereby we may ascertain if a living creature does or does not suffer pain? We know of two only for animals, three for human beings. The former, when they suffer, utter cries and make movements; the latter, while frequently exhibiting these signs, possess yet another which they use still more frequently—that of speech; they declare the pain they suffer. Clearly the necessity for this third sign shows the insufficiency of the other two. And we may well ask: If a man may be suffering, without uttering a cry of pain and without making a movement of his limbs, why may not it be so with animals? And in truth it is so. We see animals laboring under some ailment, refuse to eat, languid, exhibiting feverish symptoms; they do not cry, they do not move about, but the analogy of human beings laboring under the same symptoms assures us that they must be suffering much. Again, in almost all diseases of the brain it often happens that there is paralysis of movement with preservation of sensibility. In such cases, if the paralyzed limb be pricked, the man feels it, but still does not remove the limb. In other cases there is what is termed "painful insensibility," that is to say, the limb is paralyzed in movement and in sensation; it cannot be set in motion, it does not feel the prick of a needle, yet the sick man tells us he suffers pain in that limb. Such a condition might exist in an animal without our knowing it, for the animal could not *tell* us he suffered.

When an injury is inflicted upon any part of a man's body he feels pain, and instantly withdraws that part from contact with the instrument which is causing the injury. The injury, the pain, the withdrawal are all seemingly the work of the same instant, but in truth they form part of a long series of successive operations. 1st. The instrument produces an impression on the external nerves which enclose the body with a complete net-work. 2d. This impression is transmitted to the nervous centres. 3d. The impression is received or formed at the centres of the nerval system. 4th. The man becomes conscious of this impression. 5th. He formulates the determination to avoid further injury and to remove the injured limb. 6th. This determination is transmitted to the apparatus of movement. 7th. The movement is made. Now these different operations are performed by nervous cells or fibres of different orders. It is easily to be understood, then, that in a disease of the nerves or of the centre of the nervous system, the nerve fibres of different orders may be injured in different degrees, and some continue their functions while others cannot, and that

therefore the series of operations just described cannot be entirely carried out; they go on until the consciousness of pain, but stop before reaching production of movement. In such a case a man or animal, wounded with a knife, might suffer the utmost agony, without manifesting it by any movement. Even a word could not be spoken, or a cry uttered, because that would require the movement of the muscles of the throat.

Altogether the question of determining what pain is suffered is one beset with the greatest difficulties. The author of the work we are laying before our readers, Dr. Rabinowicz, recalls a case that came under his notice when a student in a children's hospital, the Hospital of St. Eugenie. A doctor of the establishment, a young man of thirty years of age, caught the croup, and died of it in a few days. During the illness he frequently told his colleagues that no author had described the disease thoroughly; they had not suspected the intensity of the agony it occasioned. Poor fellow! he knew it better than his teachers.

We do not declare the Jewish method of slaughtering animals to be a mode of inflicting death without pain. Nature has decreed that pain should be experienced in commencing and in ending existence. All we contend is, that it is accompanied by as little pain as possible. For take the method proposed—death by brain shock. In the brain are three distinct sets of fibres, one appropriated to sensation, the other special to motion, the third presiding over intelligence. If these nervous fibres be smitten by a destructive instrument with a very great force, they are annihilated, and those functions abolished. If the nerves of sensation be shattered, there is no more suffering; if the nerves of intelligence are thus destroyed, there is complete loss of knowledge, and so on. If the force of the destructive instrument be not sufficiently great to produce complete destruction at the first shock, there are symptoms of intense excitement and irritation, such as delirium, convulsions, frightful agonies, according to the nature of the nervous fibres injured. An examination after complete brain shock has not revealed any material alteration in the brain matter; consequently it is impossible to say which part was during life most greatly injured by the shock. But it is certain that all these parts are not equally injured, for we perceive complete loss of intelligence, while the movements of respiration are still continued, showing clearly that the brain matter governing intelligence has been injured to a greater degree than the brain matter directing motion. How about the brain matter concerned with sensation? Is it injured like that connected with intelligence and abolished, or only like that regulating movements and therefore not abolished, only irritated, and causing intense suffering? If we may judge from analogy when it is impossible, as in this case, to have direct demonstration, we should say this: In almost all diseases of the brain where there is paralysis of motion sensation is very often still complete; hence we may conclude that brain matter concerned with sensation is less susceptible of alteration by destructive agency than brain matter concerned with motion. It results, then,

that if in brain shock motion is not completely destroyed; in other words, there is pain, the creature suffers.

Let no one say that where there is loss of consciousness there can be no pain. When we say there is unconsciousness we mean only that there is no visible sign of intelligence—the patient makes no movement, utters no sound. We should pronounce him dead, if there were not still continuing breathing and circulation. But, in the series of operations described above, which are made in succession when a limb receives injury and is drawn instantly away, it was shown that the perception which causes the sensation of pain is the fourth operation, while the movement which is the manifestation of the consciousness of pain is the seventh operation. Consequently pain is endured before movement is made, and might exist where the latter had ceased to be possible, especially as pain is produced in the part of the brain concerned with sensation, while movement proceeds from another part of the brain, which is more susceptible of alteration. In this much vaunted humane method of slaughter—brain shock—then, there is no certainty that the animal does not suffer; indeed, it is probable that the animal suffers much.

Now by the method pursued by us, in which the animal dies by hemorrhage, there can be but very little suffering. We know most positively that sensation, and therefore susceptibility of pain, exists only in the nerves and in the brain and spinal marrow, and not one of these is touched with the exception of the nerves contained in the skin. But the cutting of the skin endures only for a moment, and is of no greater duration than the shock. As soon as the skin is cut, there is no more pain, because only the trachea æsophagus and the blood vessels are cut, but no nerve is wounded, and so no suffering is experienced.

Now for a moment let us consider, when the two methods we are comparing are employed by inexperienced hands, or when by some accident the animal is left some time without the operation being fully completed. By the shock method, if the animal be not felled with sufficient force, its sufferings must be frightful beyond conception. By the Jewish method the moment the blood vessels are cut, if even insufficiently, the hemorrhage will be less abundant it is true, and the pain endured continued for a longer time; but death is certain, and without great suffering, because neither brain nor nerves (except those of the skin) are hurt. Again, by the shock method, if the blow be not effectual the animal may, after seeming dead for a time, return to life just as some painful incision is being made. What frightful agony must then be endured? But with slaughter by cutting the throat, the hemorrhage prevents all possibility of return to life.

We recommend, in the words of the author, members of the Society for the Protection of Animals to study our rites, and instead of attacking them, introduce them into their slaughter-houses.—*Jewish World.*

Editor's Table.

New York Nuisances.—The *Report of a Citizens' Committee upon the Nuisances of New York*, Thos. B. Musgrave, Esq., Chairman, which we received just before going to press with our last number, has excited a good deal of public attention, and seems to have been the means, or at least a spur to the finding, of an indictment of the Grand Jury against the Board of Health. On a careful reading and comparison of this Report with our own observation and knowledge of the health laws of the city, we find it to be an evidently hasty result of mistaken zeal on the part of a public-spirited citizen, without sufficient data.

The true sources of the stenches are not the slaughter-houses, oleomargarine factories, and rendering establishments of *fresh* material, but almost wholly due to the masses of *dead animals*, *manure*, and *street dirt* in process of shipment to be taken out of the city. If the fresh meat material, instead of being rendered in the city —as at present, as fast as it accumulates—were also required to be taken out of the city, it would greatly add to the stenches, because it would also have to be massed at shipping depots, and, like the dead animals, manure, and street dirt, be subject to the beginning of putrefaction in the accumulating masses and cargoes in process of shipment. In dealing with all such material and questions pertaining thereto the Board of Health has discretionary powers. Section 14 of the Health Laws of 1866—which first established a Board of Health in New York on a scientific basis—repeatedly defines and fixes the powers of the Board as discretionary. It is empowered to suppress or modify everything which is, *in its opinion—on reliable evidence*—detrimental to health. The Court of Appeals has confirmed this discretionary power of the Board on issues which have been raised by citizens against its orders, and decided that the courts cannot review its decisions as to whether any certain thing is detrimental to health.

We would be among the last to excuse or to palliate any neglect of the Board, and our pages abundantly show it; but if the Grand Jury, which is a secret tribunal acting on *ex parte* testimony, has the power to coerce the Board by indictments and by trials to interfere with industries against which the Board has no evidence, then its discretionary power may be superseded.

We are informed that threats are frequently made against the Board of Health with a view to influencing its action; and it is not uncommon for complaints to be made which upon investigation are proven to be groundless, and in many instances found to be prompted by motives of personal interest or malice. If the Grand Jury is to have the power to indict the Board on *ex parte* statements in such cases, a pressure will be exerted upon the Board which will of necessity interfere with its fair judgment and destroy its usefulness.

Moreover, in regard to the causes of the large mortality in New York as compared with other cities, the allegations of the report are equally misleading. The excess is not in the neighborhood of the rendering establishments, but in the overcrowded tenement-house districts. Indeed, the wards in which the rendering establishments are conducted are among the healthiest in the city. The ratio of mortality for the whole city in 1877 was 25.14 per 1,000. In the Nineteenth and Twenty-first wards (comprehending the rendering establishments on the East river) the mortality was 19.86 per 1,000; in the Twentieth and Twenty-second (west side) the mortality was 23.40 per 1,000.

In the overcrowded tenement-house wards further down town the mortality was twice as great.

We do not mention this with a view of showing that stenches are not detrimental to health, but in further illustration of the rash statements of the Citizens' Report. That foul, and even dangerous odors proceed from deposits of filth and the use of sludge-acid there can be no question, and doubtless the facilities may be increased for the more speedy removal of dead animals, manure, and street-dirt, and the use of sludge-acid prohibited in rendering establishments. We do not find, however, that sludge-acid is or has been for a long time used in any of the city establishments, and we are glad to know that it has at last been suppressed at Hunter's Point: the stench from this source has doubtless been the leading one in the Citizens' Report.

Brooklyn Drinking Water and Hempstead Filth.—We are gratified to learn that since our last issue Sanitary Superintendent Raymond, of the Board of Health, has verified our statement in regard to the contamination of the Brooklyn water supply. He finds that Parsonage Creek, which is the principal supply, and which runs through the village of Hempstead, is poisoned by the refuse of one slaughter-house and several out-houses, which simply
ns numerous privy vaults. He recommends that the Board of
· Works remove the same, as that body has jurisdiction.
'e are also glad to learn that the stench ponds in South Brook-

lyn are in process of thorough cleansing, and are to be filled with clean earth. But of the Gowanus Canal sewage-receptacle we hear of no action. This nuisance will in no respect be abated by filling the sunken lots in its vicinity; and, until action is taken in regard to it, the neighborhood will continue to be a dangerous one to all the dwellers therein. And the same may be said of the terminus of the Knickerbocker avenue sewer, under a bridge on Johnson avenue; the sewage is here massed by the mere rise and fall of tide-water amidst rank marsh grass, spreading over and poisoning the soil for many acres in extent, endangering the lives of thousands of resident and passing population. The continual neglect of these great sources of poison is a virtual invitation to such devastating epidemics, sooner or later, as will call for their abatement at any cost. Length of time will be no amends for the present criminal neglect, or adequate punishment for preventable sickness and death, which is literally permissible murder, over which the people of Brooklyn, as represented by the Board of Health, have jurisdiction; and they should lose no time in holding the Board of City Works to a strict accountability for thus endangering the lives of the people.

More about Long Island and Rapid Transit.

To the Editor of THE SANITARIAN:—As a Long Islander I beg to express to you my thanks for your able and interesting editorial under this head in your last number. It is quite time the people of Brooklyn, especially, knew what a heritage they have; that they have at their very doors the finest country of any city in the Union —a country possessing more advantages, more of the means of sustenance and comforts of life, than any other land and water that can be found on the Atlantic coast north of the Gulf of Mexico. There is no other such a tract of country as Long Island in America.

It is nearly forty years since the Long Island Railroad was opened to Peconic Bay and Shelter Island Ferry. In that long period of more than a generation, nobody discovered or pretended to know that there was anything of interest on these shores more than a place to catch fish and clams.

The beautiful lands and waters of Long Island have been piping to the men of the Long Island Railroad and to the public for this long period, but received no response until last Summer, when a journey to Damascus was made, and light shone around by opening the hole in the wall that had so long shut out the Island. Brooklyn had stupidly assumed, hitherto, the character of a Chinese city, by closing its doors against all direct communication with the Island. The hole in the wall is now made through to Flatbush avenue, and better things may be anticipated.

I rejoice to see that the men into whose hands the Long Island Railroad has now fallen are gentlemen of intelligence, and will not walk in the footsteps of their "illustrious" predecessors, and that a better day has opened upon the fortunes of the long misused Long Island Railroad. I have something more to say on this subject, but must defer it until another time.

June 15th. PECONIC.

The American Medical Association.—This number we were obliged to make up in great part before leaving home for the agreeable duty of participating in the recent—and twenty-ninth—annual meeting of the American Medical Association at Buffalo, June 4th–7th. We are, therefore, for the present, constrained to a brief synopsis of the proceedings only, and to the necessity of postponing an abstract of several papers—particularly those pertaining to State medicine and public hygiene—to our next number.

Excepting deficient hotel accommodations, over which the Committee of Arrangements could have no control, this meeting was one of the most enjoyable, best attended, and most profitable ever held by the Association. The painstaking Committee of Arrangements, led by the Chairman, Professor Thomas Rochester, had from the first the fullest confidence of the profession, and the confidence was in every respect well placed. The hall was commodious and well appointed, and the places set apart for the meetings of the several sections and committees convenient of access.

The Association was promptly called to order by the President, Dr. T. G. Richardson, a few minutes after eleven o'clock on Tuesday morning, June 4th, and opened with prayer by the Rev. Dr. Van Bokkelen. Next followed the address of welcome by Dr. Rochester, the Chairman of the Committee of Arrangements, who happily stated the advantages and privileges of Buffalo as a place of meeting, the programme of business, the public attractions, and, as far as practicable, the social enjoyments in prospect. Next after Dr. Rochester's welcome the Secretary announced the reports of committees, read notes from absentees, etc., and among them the following cablegram from an ex-President:

PARIS, June 3d, 1878.

President American Medical Association—May your meeting be harmonious and contribute more than ever to the advancement of medicine. Truly sorry I cannot be with you.

MARION SIMS.

The reading of this telegram elicited marked demonstrations of approval.

The Chairman of the Committee of Arrangements made some announcements for the future proceedings and the programme of entertainments, after which Prof. James P. White, Vice-president, introduced the President, T. G. Richardson, M.D., of Louisiana, who delivered his annual address.

At its conclusion Prof. White said that it was idle for the Association to meet year after year, and hear such propositions as had been presented by the President, without adopting some plan which would mature the same.

Prof. Gross moved that the thanks of the Society be tendered to Dr. Richardson for his "excellent, very able, highly elaborated, scholarly, and finished address," and expressed the opinion that the enthusiasm thrown into it had doubtless been infused into all present, and he hoped it would bear fruit of a high order in the future.

The motion was carried.

On motion of Prof. White a committee, consisting of the President and his four immediate predecessors, was appointed to take into consideration the suggestions and recommendations set forth in the address.

We purpose a full abstract of Dr. Richardson's address, and especially the portion on State Medicine, in our next issue.

Following the President's address Dr. Wm. Brodie, of Detroit, delegate to the Canadian Medical Association; Dr. L. A. Sayre of New York, delegate to the British Medical Association, and Dr. E. Seguin, of New York, delegate to the International Medical Congress of Geneva, submitted brief reports, after which the first session adjourned.

THE WORK OF THE SECTIONS began in the afternoons at three o'clock, according to the programme, and were well attended throughout. And, while excepting the Section on State Medicine and Public Hygiene, the papers and discussions mostly pertained to practical medicine and surgery, it was a particularly noticeable feature in the leading papers and discussions, and in the Addresses of the several Chairmen of the Sections, that *preventive medicine* received unusual and increasing attention in all.

Second day.—Following the routine business in the morning Prof. Henry H. Smith, Chairman of the Section on Surgery and Anatomy, delivered his Address on "Certain Points on the Pathology of the Bones, especially Tubercle." After alluding to the opinion of former years that the skeleton was intended to support the body, he mentioned that recently a new function had been assigned it, the bones being now regarded by many as a "focus for the origin of the white and red corpuscles of the blood, and through which serious diseased matter was introduced into the general circulation."

After showing the connection of tuberculosis with septiciemia and blood poison, he discussed the original progress of tubercles in the bones, and their influence especially on Pott's hip disease, both of which he thought were of tubercular origin.

The Address was a very learned one, and occupied the closest attention of the Association for nearly an hour. It was referred to

the Section on Surgery and Anatomy, where Dr. Smith exhibited numerous pathological specimens and demonstrations in support of his paper—illustrating innutrition and bad air as the most fruitful of all sources in the production of tuberculosis. By vote of the Section, the Address was referred for publication in the Transactions.

School Hygiene.—Next after Professor Smith's address Prof. Frank H. Hamilton, of New York, by reference of the Section on State Medicine, presented the essential features of a paper prepared by Dr. E. Seguin, of New York, on "The Intervention of Physicians in Education," read by the author before the Section on State Medicine and Public Hygiene on the previous day. He stated in explanation that it was owing to Dr. Seguin's inability to speak fluently the English language that he appeared in his stead, and the author had told him in confidence that if he was born again his first duty would be to acquire a knowledge of our language.

When Dr. Hamilton had concluded the abstract of the paper he said that it was hoped that it would be well discussed. Accordingly he spoke at some length upon the subject matter, dealing principally with the hygienic affairs in New York, and emphatically endorsed the paper. Owing to the lateness of the hour, further discussion, the President announced, was unavoidably prevented. Dr. Hamilton therefore offered the following resolution, which was unanimously adopted:

Resolved, That in the opinion of this Association medical men ought to have a voice in the construction and location of public-school buildings; in the question as to the age at which children should be admitted, the hours of study, and the general management of these institutions; and to this end it is believed to be necessary that one or more intelligent physicians should be placed upon Boards of Education, Boards of Trustees, and upon other similar boards having the control of public education and schools.

On motion of Dr. Toner the paper of Dr. Seguin was referred back to the section for publication.

The next subject in order was

The Address of Prof. E. W. Jenks, Chairman of the Section on Obstetrics and Diseases of Women and Children, on "The Causes of Sudden Death in Puerperal Women." The Address was replete with facts and deductions for saving the lives of mothers, worthy of the most profound attention of all medical students and practitioners. It was referred, according to the usual course, to the

appropriate Section, and recommended for publication in the Transactions.

Third Day.—After miscellaneous business first, followed

The Address of Prof. A. L. Loomis, Chairman of the Section on Practical Medicine, Materia Medica, and Physiology. After a brief resumé of the advances recently made in his department, the Address was chiefly devoted to the consideration of the effect of domicile and climate on consumption. On its conclusion, on motion of Prof. James P. White, the following resolution was adopted:

Resolved, That a committee of five be appointed to confer with General Myer upon the subject of making observations as to the existence of ozone in various localities, and take such other steps and measures in the matter as may be necessary for the success of the object.

The paper was referred to the appropriate section, where, after discussion, it was recommended for publication in the Transactions; and on motion of Dr. N. S. Davis the following resolution was adopted:

Resolved, That the Section on Practical Medicine, Materia Medica, and Physiology recommend the appointment by the American Medical Asssociation of a committee of five members, to whom shall be referred so much of the recommendations in the Address of the President of that section as relates to the establishment of proper sanataria for consumption, and the more accurate utilizing of the various mineral waters of our country, with instructions to report at the next meeting of the Association.

We purpose a liberal abstract of Prof. Loomis' paper in our next issue.

Next following Prof. Loomis' paper in the general session was

The Address of Prof. J. L. Cabell, Chairman of the Section on State Medicine and Public Hygiene. The Address comprehended a summary of the subject, its recent progress, and its relations to practical medicine. It took the usual course before the appropriate section, and reference for publication. We purpose giving it to the readers of The Sanitarian, as soon as practicable, entire.

Other special papers before the Section were: Studies of an Epidemic of Diphtheria, which prevailed at Ferrisburg, by Dr. H. I. Bowditch; the Intervention of Physicians in Education, by Dr. E. Seguin; the Bearings of Hygiene on Therapeutics, by Dr. J. R. Black; Reports on Defective Drainage and Water Supply, by Dr. Thos. M. Stevens, Dr. John W. Trader, and Dr. A. N. Carrigan. Dr. J. S. Billings, U. S. A., gave an exceedingly interesting

exhibit of the plans of the Johns Hopkins Hospital Buildings. A full abstract of these papers hereafter.

Fourth day.—The first business in order, after miscellany, was

The Address of DR. WALTER KEMPSTER, of Oshkosh, Wis., Chairman of the Section on Medical Jurisprudence, Chemistry, and Psychology, on "The Relations of Pathology to the so-called Motor Centres," which was received with marked and well-deserved attention. It was referred to the appropriate section, and, after discussion, for publication in the Transactions.

Of numerous other papers, reports, and discussions, many of them highly important in their relations to preventive medicine, we have not even room for a catalogue.

Officers and Committees elected, and appointments for the ensuing year:

President—Theophelus Parvin, M.D., of Indiana.

Vice-Presidents—A. J. Fuller, M.D., Maine; W. F. Westmoreland, M.D., Georgia; John Morris, M.D., Maryland; John H. Murphy, M.D., Minnesota.

Permanent Secretary—W. B. Atkinson, Pennsylvania.

Treasurer—Richard J. Dunglinson, M.D., Pennsylvania.

Committee on Library—Johnson Eliot, M.D., District of Columbia.

Librarian—William Lee, M.D., District of Columbia.

Next Place of Meeting—Atlanta, Ga.

Time of Meeting—First Tuesday in May, 1879.

Assistant Secretary—Scott Todd, M.D., Atlanta, Ga.

Committee of Arrangements—J. P. Logan, Chairman; H. V. M. Miller, G. G. Crawford, H. L. Wilson, J. F. Alexander, J. M. Johnson, Charles Pinckney, V. H. Tallioferro, J. T. Johnson, all of Atlanta, Ga.

Committee on Prize Essays—Robert Daltaye of Rome, Ga.; J. G. Westmoreland, Atlanta, Ga.; Wm. A. Love, Atlanta, Ga.; Robert Ridley, Atlanta, Ga.; Henry F. Campbell, Augusta, Ga.; J. H. Van Deman, Chattanooga, Tenn.

Committee on Publication—Dr. Wm. B. Atkinson, Chairman; Doctors T. M. Drysdale, A. Fricke, S. D. Gross, C. Wister, R. J. Dunglison, of Pennsylvania, and Wm. Lee, District of Columbia.

The Committee also report the following nominations for Chairmen and Secretaries of Sections for 1879:

Section I., Practice of Medicine, Materia Medica, and Physiology—Dr. Thomas F. Rochester, Buffalo, N. Y., Chairman; W. C. Glasgow, St. Louis, Mo., Secretary.

Section II., Obstetrics and Diseases of Women and Children, E.

S. Lewis, New Orleans, Chairman; J. R. Chadwick, Boston, Mass., Secretary.

Section III., Surgery and Anatomy—Moses Gunn, Illinois, Chairman; Dr. J. R. Weist, Indiana, Secretary.

Section IV., Medical Jurisprudence, Chemistry, and Psychology—Dr. William M. Compton, Mississippi, Chairman; L. M. Eastman, Maryland, Secretary.

Section V., State Medicine and Public Hygiene—Dr. John S. Billings, U. S. A., Dictrict of Columbia, Chairman; Dr. John T. Reeve, Wisconsin, Secretary. *Members:*

Ala.—J. Cochrane.	Ark.—W. F. Cheeney.	Col.—C. Dennison.
Ct.—C. A. Lindsley.	Del.—Wm. Marshall.	D. C.—T. Antisell.
Ga.—J. W. Bailey.	Ill.—H. A. Johnson.	Ind.—J. F. Hibbard.
Neb.—J. Black.	Ia.—J. A. Blanchard.	Ky.—S. Brundeis.
La.—S. E. Chaillé.	Kan.—D. W. Stormont.	Me.—A. P. Snow.
Md.—T. B. Evans.	Mass.—H. I. Bowditch.	Mich.—H. B. Baker.
Minn.—C. P. Adams.	Miss.—Wirt Johnson.	Mo.—J. Greiger.
N. H.—G. P. Crum.	N. J.—E. M. Hunt.	N. Y.—A. N. Bell.
O.—J. C. Reeve.	Penn.—B. Lee.	R. I.—E. M. Snow.
S. C.—R. A. Kinloch.	Tenn.—T. A. Acheson.	Tex.—H. W. Brown.
Vt.—L. C. Butler.	Va.—F. D. Cunningham.	Wis.—J. T. Reeve.
Fla.—G. N. Belton.	W. Va.—E. A. Hildrith.	N.C.—C. J.O'Hagen.
U.S.A.—J. Smith.	U. S. N.—J. Wilson.	Ore.—H. Carpenter.

Judicial Council—To fill a vacancy caused by death—John P. Gray, Utica, N. Y.

In place of the seven whose terms expire at this meeting—D. A. Linthicum, Arkansas; Foster Pratt, Michigan; A. Woodward, Connecticut; J. M. Toner, District of Columbia; J. H. Van Deman, Tennessee; S. N. Benham, Pennsylvania; R. N. Todd, Indiana.

Committee on Necrology—J. M. Toner, District of Columbia, Chairman.

Committee on Ozone—Drs. N. S. Davis, of Illinois; J. S. Billings, U. S. A.; W. N. Giddings, South Carolina; J. M. Toner, District of Columbia; and S. M. Bemis, of Louisiana.

Committee on Sanitaria for Consumption and the more Accurate Utilization of Mineral Waters—Drs. H. I. Bowditch, of Massachusetts; A. N. Bell, of New York; J. L. Cabell, of Virginia; S. E. Chaillé, of Louisiana; Ch. Dennison, of Colorado.

Intervention of Physicians in Education—Drs. R. J. O'Sullivan and E. Seguin, of New York; Wm. Clendenin, of Ohio; D. F. Lincoln, of Massachusetts; Wm. H. Van Bibber, of Maryland.

Receptions and Entertainments were given by Mr. and

Mrs. Bronson C. Rumsey; Dr. and Mrs. James P. White; the Buffalo Club; Buffalo Fine Arts Academy and Society of Natural Sciences; Physicians of Erie County—Excursion to Niagara Falls and Collation. Of these, without any risk of trespass on the sacredness of social life, we may be permitted to state that while the American Medical Association is privileged to indulge the most pleasant memories of its places of meeting, annually, by reason of the hearty welcome and generous hospitality commonly extended to it, none have ever made deeper or more endearing impressions than the good people of Buffalo.

To the Press of Buffalo—The Association is under lasting obligations for unexampled courtesy, faithfulness, accuracy in detail, and fulness of reports of the proceedings.

The Association of American Medical Colleges convened at Buffalo, N. Y., June 3d, 1878. The President, Prof. J. B. Biddle, of Jefferson Medical College, presided, and Dr. L. Connor, of Detroit Medical College, performed the duties of Secretary.

The Secretary presented a report, from which it is learned that there are twenty-five regular members and one affiliated member. Two colleges—the Medical Department of Harvard and the Medical Department of the University of Pennsylvania—regard it unadvisable for them to join the Association.

Several resolutions were offered in the interest of more thorough medical education. In the discussion of which Professor Davis, of Illinois, referred to the efforts made to improve college instruction during the past twenty-five years, and thought that sentiment had reached a point which demanded an advancement in medical education. He favored a three years' course of instruction of not less than eight months' duration per year, and no student should enter upon his studies in any college until he had first given some evidence of preparation. He hoped to live to see the medical profession at the head of all science, where it belonged, and the adoption of the resolutions would be an important step in the right direction.

The following named officers were elected for the ensuing year:

President—Prof. J. B. Biddle.

Vice-President—Prof. N. S. Davis.

Secretary and Treasurer—Prof. L. Connor.

The American Medical Editors' Association held its annual meeting at Buffalo on the evening of June 3d, 1878, and, after the usual routine and miscellaneous business, heard the annual address by the President, Dr. John P. Gray, of New York, on an *Abstract of the Law of New York State in regard to the Commitment of In-*

sane to Asylums, their Detention and Discharge, compared with the Statutory Provisions of England. The address was a careful summary of much practical value, and listened to with deserved interest by a large number of physicians outside the membership of the Editors' Association. We hope to make room for it in full hereafter.

Officers of the Association elected for the ensuing year President, Dr. William Brodie, Detroit; Vice-President, Dr. J. A. Miner, Buffalo; Secretary, F. H. Davis, Chicago.

In Memory of Joseph Henry.

Professor Joseph Henry died in Washington, May 13th, 1878, aged 81. He was born in Albany, N. Y., December 17th, 1797. After receiving a common school education, he took a course of study in the Albany Academy, and in 1826 was appointed one of its teachers. In 1827 he began a series of experiments in electricity, and in 1828 published an account of various modifications of electro-magnetic apparatus. He was the inventor of the first machine moved by the agency of electro-magnetism. In 1829 he exhibited electro-magnets which possessed magnetic power superior to that of any before known, and subsequently constructed others on the same plan, one of which sustained 3,600 pounds, with a battery occupying about a cubic foot of space. In 1831 he transmitted signals through a wire more than a mile long, causing a bell to sound at the farther end of the wire; and in a published account of this machine soon after, he pointed out the applicability of the facts demonstrated to the instantaneous conveyance of intelligence between distant points. In 1832 he was appointed Professor of Natural Philosophy in the College of New Jersey, at Princeton, where he continued his experiments and researches. In 1833 he mentioned the project of the electro-magnetic telegraph, and demonstrated that it might be used to produce mechanical effects at a distance. In 1846, on the organization of the Smithsonian Institution at Washington, he was appointed its Secretary, a position which he held up to the time of his death, and which gave him the principal direction of the institution. He was also the founder of the Signal Service System, and one of the greatest contributors to the modern improvements in light-houses. His discoveries in physics are numerous, the most important being described in various standard works. He was the author of "Contributions to Electricity and Magnetism," published in 1839, and many papers in the "American Philosophical Transactions," in "Silliman's Journal," in the "Journal of the Franklin Institute," and kindred periodicals.

His career from a boy was marked by economical habits, patient industry, diligent study, kind-hearted urbanity, and eminent trustworthiness; his goal the universal esteem and honor of mankind, and a blessed memory for future generations.

Death-rates per 1,000 inhabitants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Pox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Typ. Fevs	Malarial Fevers.	Diarrhœal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500—4 weeks ending May 18...	1872	22.49	806	325		74	78	30	37	34	15	26	70	25	178
Philadelphia, 850,900—2 weeks ending June 8. .	538	16.65	177	92		13	24		10	6	14		20		29
Brooklyn, 528,000—4 weeks ending May 18.....	748	18.37	313	107		32	36	9	18	9	6		18	7	58
St. Louis, 500,000—5 weeks ending June 1.....	471	12.02	197	58		4	4	12	6	1	4	12	15	5	49
Chicago, 460,000—4 weeks ending June 1.... ...	442	10.02	219	56		8	10	1	6	27	6		9	7	
Baltimore, 350,000—5 weeks ending June 8.....	690	23.29	348	105		19	13	2	8	4	10		95		64
Boston, 363,000—4 weeks ending June 1.....	523	18.74	191	95		29	1	19	13	7	10		16	5	
Cincinnati, 280,000—4 weeks ending June 1.....	301	14.00	135	42	1	7	13	1		1	4		3		21
San Francisco, 300,000—month of April.....	425	16.67	131	68		12		2	8	2	9		9		21
New Orleans, 210,000 –4 weeks ending May 26...	413	25.56	145	68	12	3			4		7	15	54	1	41
Washington, 160,000—month of April..	319	23.92	153	62			15			4	7		6		
Pittsburgh, 145,000—.....															
Newark, 126,000—.....															
Providence, 103,000—month of May.....	131	15.22	36	34		11	2	1			2		3		6
Milwaukee, 123,000—month of April..... ...	142	13.06	33	12		11	4		1	1	1		2	4	9
Rochester, 70,000—month of May.....	114	12.32	28	23			2			2	2	1	1		12
Richmond, 77,000—4 weeks ending June 8.....	108	18.11	53	20			8			2	3		9		15
New Haven, 60,000—month of May..... ..	87	17.72	27	21			1		2				1		
Charleston, 57,000—5 weeks ending June 1.....	169	30.91	79												11
Toledo, 50,000—month of April.....	51	12.24	20	7		1	1								2
Mobile, 40,000—month of April.....	53	15.05	12	10							2		2		4
Dayton, 36,000—4 weeks ending June 7.....	30	10.58		7											
Nashville, 27,000—month of May...	51	17.76	23	6			1	3	1	2			3		4
Wheeling, 28,000—.....															
Buffalo, 170,000—.....															
Knoxville, 13,000—.....															
Paterson, 40,000—month of April.....	68	20.07	33	8			1		1						
Petersburg, 20,000—.....															
Selma, 8,000—.....															
Elmira, 20,090—month of May	27	16.74	6	8		1	2			1					
Yonkers, 18,500—month of May.....	17	11.00	3	7			1		1			1			
Memphis, 45,000—.....															
Detroit, 115,000—.....															
Syracuse, 60,000—.....															
Reading, 40,000—															
Sacramento, 25,000—month of April.....	32	15.06	5												
Minneapolis, 44,000—month of April.....	37	12.31	12	9			2								
Bowling Green, 6,000—.....															
St. Paul—.....															
Wilmington—month of April	64		23	16					3		2				4

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Correspondents under this head are particularly requested to forward their communications *regularly*.

Ohio Medical Society Transactions, 1877, comprise annual address of the retiring president, W. J. Scott, M.D., on Medical Education; Antiseptic powers of Sulphate of Quinine, by Thos. W. Gordon, M.D.; Milk-sickness, by S. S. Gray, M.D., a disease of animals, also called Trembles, Slows, etc., chiefly of the herbivorous class. It seems to have prevailed in various regions of the West for many years, and under such a variety of circumstances as not only to have involved doubt in regard to the nature of the disease, but of its very existence.

The conclusions arrived at are: 1, It is a specific disease; 2, It is a disease produced by taking a poison into the stomach with the food; 3, It originates alone in wild uncultivated lands; 4, Cultivation destroys it; 5, The specific poison has not as yet been discovered; 6, Herbivorous animals are the first to be poisoned with it, and afterwards it is transmitted to carnivorous animals and man, by their flesh or milk; 7, No antidote has yet been discovered; 8, That there should be a more thorough and systematic investigation of this disease by post-mortem and analytical examination.

The Prevention and Spread of Syphilis, by C. S. Muscroft, M.D., is an echo of the papers of Professor Gross and Dr. Simms. The purport of the paper is to memorialize the Legislature for power to adopt some plan for its control, to be carried out under the auspices of the State Board of Health. The other papers are: Manipulations in the Reduction of Dislocations, by S. F. Forbes, M.D.; Paracentesis of the Cornea, by S. C. Ayres, M.D.; Surgical Treatment of Perityphlitic Abscess, by J. H. Pooley, M.D.; Purulent Ophthalmia, by X. C. Scott, M.D.; Chloral Hydrate in Puerperal Convulsions, by Jonathan Morris, M.D., and reports on Obituaries.

Transactions of College of Physicians, Philadelphia, 1877, contain Thrombosis of Cerebral Veins, by A. V. Meigs, M.D.; Lister's Antiseptic Method of Treatment in Case of Lacerated Wounds of Elbow-joint, Treatment of Old Dislocations of the Shoulder, by Subcutaneous Sections, and a Case of Peripheral Necrosis, by I. E. Mears, M.D.; Post-mortem Imbibition of Poisons, by J. J. Reese, M.D.; Internal Administration of Nitrate of Silver, and Blueline upon the Gums as Earliest Sign of Argyria, by Wm. Pepper, M.D.; Malignant Disease of Retro-peritoneal and Messenteric Glands, Ribs, and Vertebræ, etc., by J. J. Hutchinson, M.D.; State of Medicine in China, by Robert Harris, M.D.; Relapses in Typhoid Fever, by J. M. Da Costa, M.D.; Changes in the Nails in Fever, by Morris Longstreth, M.D.; Hemiopia and Decussation in the Optic Chiasm, by Geo. C. Harlan, M.D.; Ophthalmoscope as an Aid to Medical Diagnosis, by M. J. Lewis, M.D., and Report on Meteorology and Epidemics for the year 1876, by R. A. Cleeman, M.D. Several of these papers are illustrated by diagrams and plates, and of much importance to all practitioners of medicine and surgery. The last one especially, the report on Epidemics in Philadelphia for the Centennial Year, is of special interest to preventive medicine. "The whole number of interments of persons dying in Philadelphia during the year 1876, exclusive of infants prematurely born (244), was 18,892." Estimated population at middle of year, 830,000; ratio of deaths per 1,000 22.9. Previous year 22.6, and average for the ten preceding years 21.6; 24 per cent. of the whole were infants under one year old; 25 per cent. of zymotic diseases, and of these: of small-pox, 407; scarlatina, 328; diphtheria, 708; croup, 386; typhoid fever,

774; and cholera infantum, 1,173. . . . The mortality from typhoid fever was nearly double that of the previous year, and greater than any year since 1865, when it was 773, in a population one-third less. Of the whole number of deaths from typhoid fever, more than two thirds occurred in the latter half of the year, August giving the most, and December next. The deaths were "distributed over nearly every ward of the city." High temperature and August drought—lowering the water in the soil—are suggested as probable causes; and "is it being too speculative to imagine that of the hundreds of thousands of strangers who visited the world's fair, there were many who brought with them to a congenial soil the germs of this disease?" Decidedly, especially in view of "the cesspool system of disposal of alvine excreta which prevails in Philadelphia, . . . in the rear of every house, except that the nearest tenements are sometimes clustered round one which does duty to the whole group. . . . The pits are often but imperfectly lined, allowing the noxious matters to penetrate into the surrounding soil. . . . Streets are constantly being excavated for laying down or repairing gas and water pipes, and the yards of adjacent lots dug out for new buildings," etc., etc. And besides this abundance of local causes, the water supply was by no means beyond suspicion, though the reporter thinks the charges made against it at the time could not be sustained. Diphtheria was also greatly in excess of any previous year, and, like typhoid fever, throughout the city, and probably due to the same local causes. The deaths from it were most numerous in the first quarter of the year, and next in the last. Of the rest—of zymotic diseases (excepting small-pox, which was 407, against 56 of the preceding year)—there was on the whole a decrease in the mortality for the year. It is especially notable as the result of a good police that, notwithstanding the scrambling crowds surging among the vehicles about the gates of the Exhibition, crowding the platforms and hanging on to the sides of horse and steam cars, the number of violent deaths for 1876 was smaller than for the previous year.

The Magazine of American History continues from month to month to add to the stock of *new* old history of interest to every American who would know the history of his country. A. S. Barnes & Co., New York.

Proceedings of the Medical Society of the County of Kings, Brooklyn, N. Y., for the year, March, 1876, to February, 1877, constitute a closely printed octavo volume of 276 pages. It comprehends the society work of nearly three hundred active members; contains about forty special papers on practical medicine and surgery, with minutes of the discussions thereon, and numerous practical notes and excerpts from current medical literature. Besides this volume of proceedings, the Kings County Society is the largest contributor of any county society in the State to the Transactions of the State Medical Society, and its papers will compare favorably, not only with any medical society in the State, but with any in the country. The *Proceedings* are conducted by the Council, the Executive Committee, and sent to all the members of the society, monthly. To subscribers, $1.50 per annum. Everet Hall, 398 Fulton street, Brooklyn.

Coughs and Colds* are among the most common and insidious of all

* Colds and Coughs: Their Causes and Consequences. Notes on Lectures delivered at Gresham College. By E. Symes Thompson, M.D., F.R.C.P.; Physician to Hospital for Consumption and Diseases of the Chest, Brompton, Gresham Professor of Medicine, etc. 12mo, pp. 120. Philadelphia: Lindsay and Blakiston.

ills which flesh is heir to; and it is fortunate for both physicians and patients that there are occasionally among the former individuals with large experience, who possess singular capabilities in condensation, who can present a large amount of practical knowledge in small space, by which it becomes useful in the largest degree, because it is thus rendered the most accessible. Dr. Thompson fulfils this condition eminently in the little manual which forms the subject of this notice.

State Regulation of Vice* is a forcible essay against the ostensible efforts for the suppression of vice by license to perpetuate it: a process about as reasonable as it would be to expect to promote temperance by the licensing of grog-shops, and as little likely to restrain vice, or the diseases caused by its indulgence, in the one case as in the other. The author of the book before us is evidently an enthusiast in opposition to the partial and futile attempts hitherto made to regulate vice by protecting it, in the male at least, and urges the conclusions of the Geneva Congress, that while prostitution is a fundamental violation of the laws of health, the attempts to control it by registration and the revolting practice of surgical examination of prostitutes are debasing in their nature, more calculated to perpetuate than to restrain vice, particularly in men; and that all laws for its restraint should be made to bear equally on both sexes. To punish *all* inducements to debauchery, corruption of minors, procurism, kidnapping, luring, seduction, sequestration for immoral purposes, the letting and keeping of houses of prostitution, should all be regarded as crimes before the law of equal magnitude in the sexes, and be dealt with accordingly.

Pettengill's Newspaper Directory for 1878 contains an immense amount of information on newspapers and other periodical literature not elsewhere to be obtained. (1) A list of all those published in the United States and the Canadas; (2) a list *by counties* for the special convenience of advertisers who desire to cover particular portions of the country; (3) and (4) of all daily, weekly, and monthly publications having a circulation of 5,000 and upwards; (5) religious papers which admit advertisements; (6) agricultural papers; and (7) of the leading papers of Great Britain (metropolitan and provincial), of Continental Europe and Australia. Total number published in the United States, 8,133; British America, 482. All are so classified as to afford great convenience to advertisers and others interested in periodical literature. To advertisers especially the work is a *sine qua non*, not only for *where* to advertise, but *how;* the examples given in the getting up of the work being of great utility. Altogether, the book appears to be a complete one of its kind, and unequalled by any similar publication.

Godey's Lady's Book—*the* lady's book *par excellence*—which combines more of the useful, ornamental, and entertaining qualities necessary to all ladies who would be informed on the affairs of the household, the refinements of fashion, and womanly literature, than any other magazine published—has just closed, with the June number, its 96th volume! If there are ladies in the country who have not yet begun to take Godey's, it is time they had; and the sooner, the less they will regret for not having begun before. Godey's Lady's Book Publishing Co., Philadelphia.

* State Regulation of Vice. Regulation Efforts in America. The Geneva Congress. By Aaron M. Powell. New York: Wood & Holbrook.

Duhring's Atlas of Skin Diseases,* Part III., is fully up to the standard of excellence which has characterized the preceding parts. The plates of this part are, eczema (squamosum), sypholoderma (erythematosum), purpura (simplex), and sypholoderma (papulosum et pustulosum). They are in all respects admirably executed object-lessons, strikingly natural in appearance, conveying information wholly beyond the possibilities of any verbal description of the objects they represent: all from life, and nearly life-size, chromo-lithographed in the best manner.

The Eulogy upon Lunsford Pitt Yandell, M.D., by Theodore S. Bell, M.D.,† is alike creditable to the heart and head of the eulogist and the eulogized. Few men have filled a larger space or better deserved it in the affections of all who knew him than Professor Yandell, and to none was he better known than to Professor Bell, his student, companion, and friend for nearly half a century. As a Christian gentleman, diligent student, ripe scholar, and faithful teacher, Prof. Yandell's works will long follow him, and this memorial by one who knew him so well will serve to add lustre to his name and cherish his memory for many generations to come.

Old Age: Its Diseases and Its Hygiene,‡ was the last literary effort of Dr. Lunsford P. Yandell. It is a profitable summing up of much sound reflection, illustrated by numerous examples of longevity, with a glance at the conditions promotive of it, and may be read with profit by all lovers of hygiene.

Dr. Richardson's Address on the Future of Sanitary Science we are glad to have received in a neat pamphlet form, suitable for general circulation.* It shows the progress sanitary science has made, the progress it is likely to make, and its probable influence in the future among the governing elements of society in its medical, political, and social aspects, characterized throughout by the comprehensiveness and clearness of statement common to its distinguished author, and well merits what it will doubtless receive—an extensive circulation.

The Reference and Dose Book, by C. Henry Leonard, M.A., M.D., Detroit, Mich., is a very useful office and pocket catalogue of names, ready remedies, and doses which should be committed to memory.

The Illinois State Medical Register, published annually, under the supervision of the Chicago Medico-Historical Society, with the coöperation of the Illinois State Medical Society, edited by D. W. Graham, A.M., M.D., is necessary to all the physicians of Illinois, and useful to everybody interested in having an authentic catalogue of all the regular practitioners of medicine in that State.

Several other Reviews, Notices, and Acknowledgments, already in type, unavoidably crowded over to next month.

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* Atlas of Skin Diseases. By Louis A. Duhring, M.D. Part III. Philadelphia: J. B. Lippincott & Co. Price $2.50 per part.

† Memorial Address upon the Life and Services of Lunsford Pitt Yandell, M.D. By Theodore S. Bell, M.D., Professor of Theory and Practice of Medicine, University of Louisville. Reprint from *American Practitioner*, April, 1878.

‡ Old Age: Its Diseases and its Hygiene. By Lunsford P. Yandell, M.D. Reprint from *American Practitioner*, February, 1878.

* The Future of Sanitary Science. An Address Delivered before the Sanitary Institute of Great Britain at the Royal Institution, July 5, 1877. By Benjamin Ward Richardson, M.D., LL.D., F.R.S., etc. London: Macmillan & Co. Price one shilling.

THE SANITARIAN.

A MONTHLY MAGAZINE.

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STATE MEDICINE AND PUBLIC HYGIENE.

By Prof. J. L. Cabell, M.D.,

Chairman of Section on State Medicine and Public Hygiene, American Medical Association.

Address delivered before the Association at its annual meeting, Buffalo, N. Y., June 6th, 1878.

Inasmuch as a special ordinance of the Association makes it the duty of your permanent Secretary to report annually the names of States where Boards of Health exist, and also of those which decline to establish them—said report to form a part of the annual proceedings of the Association—I am thereby relieved of this portion of my duty in relation to the advances in State Medicine during the past year. I cannot, however, forego the opportunity of saying that the establishment of a General Board of Health is the indispensable initial measure of any systematic effort to inaugurate State Medicine in any of the States of the Federal Union. What has been accomplished in this direction during the past year will be reported by the Secretary in conformity with the requirements of the ordinance to which I have alluded. What may be effected towards the protection of the health of communities by judicious sanitary legislation, conceived and subsequently carried into execution by the sanitary advisers of the State, is strikingly exhibited in the result of an obstinate contest of the butchers of Boston with the State Board of Health—a contest which continued for five or six years, but which finally terminated in a complete triumph for the Board by the abatement of a nuisance of great magnitude and of an extremely dangerous character, affecting the populous town of Brighton, which thereafter became a salubrious and agreeable place of residence. Dr. Bowditch, President of the Board, has stated that it required a "thirty-years' war" before the Legislature of Massachusetts was conquered; but in view of what has been effected by this Board, assuredly the fruits of this victory have amply compensated for all the labor expended in the protracted contest, and the lesson is one by which others may profit.

The first step taken by the newly-created Board was to address a

circular letter to the civic authorities of every city and town, to every member of the Legislature, and to every physician and clergyman in the commonwealth, inviting their sympathy and co-operation, and especially soliciting the nomination of "a medical correspondent in every town to whom they could apply for local information," some physician possessing the confidence of the local community who would be willing for the public good to report to the Board facts relating to disease occurring within the jurisdiction of his town. I cite this fact—which, as relating to voluntary services of private individuals, may at first view seem to have but little bearing upon the question of State medicine—not only because such services, solicited by the official sanitary advisers of the State, were designed to be in aid of the newly inaugurated system of State medicine, but also and chiefly because it serves to exemplify one of the ways in which the ground may be prepared for State action.

It was doubtless foreseen by these earnest pioneers in the work of inaugurating State medicine in America that legislation was little likely to go ahead of popular opinion and consent, or to be of much practical utility if it were thus pressed forward, and they therefore recognized the importance of directing the attention of the citizens to well authenticated and significant facts collected in their respective communities by physicians in whom they could confide. Then, it was hoped, the demand for sanitary legislation would come up from the people themselves.

Now as to the value of sanitation in general in diminishing the death-rate, some very remarkable illustrations recently stated in a public address by that eminent lay sanitarian, Mr. Edwin Chadwick, may be cited here as an exponent of the latest "advances and discoveries" in the practical applications of sanitary science. This address "On the Present Position of Sanitary Science, for its Future Practical Advancement," was delivered by Mr. Chadwick, as President of the Health Section of the British Social Science Association, at Aberdeen, September 13, 1877, and contains many striking and suggestive facts which, so far as I know, have not been published elsewhere. He has successfully shown that a norma of sanitation for the infantile stages of life may be established with factors that go to the prevention of an annual excess of upwards of 50,000 deaths in the school stages of life, in England and Wales.

The details of this statement are extremely interesting and important, but inasmuch as the entire address has been published in recent numbers of THE SANITARIAN, and a condensed summary of the chief results obtained of the progress of the power of sanitation will be found in the June issue of that journal, I forbear a detailed recital. Let it suffice to state that Mr. Chadwick has shown that in well-regulated institutions for children, and for adult populations in prisons, the death-rate may be reduced to about 3 in 1,000—that is to say, nearly one-fourth the general death-rate of children of the school ages, including the children of the well-to-do classes of the population.

In view of the actual and the prospective success of such systematic sanitation in England, some writers in that country seem to apprehend an overplus of population and to entertain doubt whether

there was not more harm than good in such success in sanitary work. "Medical Science," says Mr. Gregg, "is mitigating suffering and achieving some success in its warfare against disease; but at the same time it enables the diseased to live. It reduces the aggregate mortality by sanitary improvements and precautions; but those whom it saves from dying prematurely it preserves to propagate useless and imperfect lives."

Dr. Ransome, in quoting this remark, gives an overwhelming answer from Mr. Gregg's own point of view. "It appears," he says, "to be forgotten that most of the evils that we deplore in our town populations, the disease and feebleness from which they suffer, are the direct outcome of the unhealthy circumstances in which they live. If the conditions of existence in towns continue as they now are—if the fever nests, the breeding-places of scrofula and consumption, the temptation to intemperance and vice, are left unchecked to do their malignant work, then indeed we may certainly look for deterioration of race, but sanitarians will not be responsible for the result."

PUBLIC HYGIENE.

The evidences of an advance in public hygiene with reference to the maintenance of the purity of the air within and around dwellings consists not so much in the discovery of new facts or principles, as in more careful, exact, and honest methods of sanitary engineering, in conformity with well-known laws of sanitary science. It can scarcely need to be said that one of the most fruitful sources of impurity of the air around dwellings, and consequently of the air within dwellings, since the latter is constantly being replaced by the former, is the damp condition of the ground, which, however well drained of subsoil water at first, is liable to subsequent contamination with liquid filth, whether arising from slops thrown upon the surface of yards or gardens, or from the dejections of animals. A soil well aerated by proper water-drainage would, in a measure at least, oxidize the organic matters and mitigate the generation of malaria. It would not, however, be safe to rely upon this to disinfect the excrement-sodden soil in the streets of cities, and it becomes an important problem of sanitary engineering how to protect the atmosphere of cities from this source of contamination. This end will probably be secured by the best asphalt pavements, such as have been largely used in some of the cities of Europe, and have been successfully introduced in some parts of Brooklyn and on the principal avenues of the national metropolis. In addition to the other valuable qualities of firmness, noiselessness, durability, with facility of removal when necessary for laying water or gas pipes, and equal facility in repairing the breaches thus made, their non-combustibility, and finally their comparative cheapness, they are also clean and impervious. No water or filth can penetrate them, and they are easily cleaned at less expense than any other pavement. A necessary condition, however, of the beneficial action of impervious pavements is the absolute freedom of the sub-soil from the contamination which might arise from defective sewers or from percolation of the contents of cesspools. The late Dr. Parkes, in his report on hygiene for 1873, suggested that a peculiarity of house construction

in Munich, which may have an influence in drawing air from great depths, might furnish a solution of the facts observed in that city by Pettenkofer and others respecting the relation between the ground-water and the prevalence of typhoid.

"The houses in Munich have cesspools beneath them, which are emptied by a hose and steam-engine, from time to time. The cesspools are in many instances not cemented; and Wolfsteiner mentions that he resides in a large house with many other inhabitants, and calculates that yearly thirty-five tons pass into the cesspool under the house; yet in twenty years hardly twenty-five tons have been removed, so that in twenty years 675 tons of excrement have soaked into the ground. Now in Munich the warm houses help to draw the cesspool air into the rooms, and as the streets are beautifully paved, and no gas can escape through them, the cesspools and houses must be the only ventilating shafts for the soil air."

Dr. Frankland has recently investigated the conditions under which organic germs pass from sewage into air, and by means of decisive experiments has demonstrated the fact that the breaking up of minute gas bubbles, resulting from fermentation or putrefaction, is a cause of the suspension of solid organic particles in the air. If, therefore, through the stagnation of sewage, or constructive defects which allow the retention of excrementitious matters for several days in a sewer, putrefaction sets in, then gases are generated, and the dispersion into the air of zymotic germs is very probable. It is therefore of the greatest importance that foul liquids should pass rapidly and freely through drainage pipes and sewers, so as to secure their discharge before putrefaction sets in.

In the *Sanitary Record* for April 13th, 1877, Mr. Baldwin Latham discussed the importance of hydro-geological surveys from a sanitary point of view, and later in the year, namely, on the 5th of October, read a paper on the same subject before the Sanitary Institute of Great Britain, at Leamington. He cited several instances in which a knowledge of the direction of the underground current, as determined by the geological formation, would have prevented contamination of wells by appropriate location of cesspools. In view of numerous specifications given by him it is evident that the assignment of a minimum "protective distance" of four or five hundred yards from a cemetery gives no guarantee of safety, if the well should be below the contaminating source, as to the direction of the subterranean flow. This recalls the outbreak of typhoid fever at Lausanne, near Basle, in Switzerland, a few years ago, when it was proved by positive experiments that the contaminating material was carried two miles under a hill to a village on the opposite side, this village being on the direct line of flow of the subterranean water, and on a lower grade.*

* "In conducting a hydro-geological survey, it should be thoroughly borne in mind that, though as a rule water underground follows the natural inclination of the surface of the district, often there are exceptions to this rule. There are also circumstances which may modify the flow of water, such, for example, as the abstraction of a large volume of water at a particular point by pumping from a well, which well would become the centre for a drainage-area extending, in all probability, for a considerable distance from the well; or in some flat districts the elevation of the water line of a river, in time of flood,

The now well-known influence of dampness of soil in causing consumption, as demonstrated by Buchanan in England and Bowditch in America, makes it a matter of the first importance to select suitable ground for dwelling-houses. When in towns and cities such a selection is precluded by the necessity of occupying a definite spot, and the retentiveness of a stiff clay soil does not admit of effectual underground drainage, it is held by the best sanitary architects that dwellings should be constructed without cellars and be well raised above the ground, with a free ventilation between the surface and the ground floor of the house.

As to other sanitary requirements in connection with dwellings I need say no more than that the greatest trouble relates not so much to the want of a clear conception of what is required as to the practical difficulties of execution. They are questions of architectural and sanitary engineering rather than of scientific principles. All concede the great importance of thorough ventilation of sewers and soil pipes, but sanitary engineers still differ widely as to the safest and most effective means of accomplishing this object.

I am not aware that any real progress has been made towards a definite solution of the great sanitary problem of the purification and final disposal of sewage since the elaborate reports of Dr. C. F. Folsom, Secretary of the State Board of Health of Massachusetts, in the seventh and eighth annual reports of the Board. From these exhaustive reports it appears that purification by the oxidizing influence of a porous soil is the only process which gives satisfactory results, and that these results may be almost complete if the operation be well conducted.

The common practice in America of discharging the sewage of cities and towns into the nearest river or running water will not long be tolerated where other populations are dependent, wholly or in part, on such streams for their water supply. Massachusetts has already followed the example of Great Britain in legislating against the pollution of rivers.

HOW TO PREVENT THE SPREAD OF CONTAGIOUS DISEASES.

It is needless to say that there are almost insuperable difficulties in the way of stamping out the infectious diseases which are yet theoretically preventable. In addition to the obstacles arising from false ideas of economy, intensified by ignorance and sloth, we have to encounter yet graver difficulties in the fact that nearly all the infectious diseases are subject to epidemic as well as local influences,

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may reverse the direction of the flow of the underground water, unless, as is the case with some wells which are known to be tidal, the volume of water flowing to the river is very large. It is hardly possible, in a town where there are so many points for pollution, to so locate a surface well as not to be affected by some of them. The use of the water from surface wells within a town ought, therefore, to be prohibited being used for domestic purposes. It is rather singular that, while measures are being adopted for the prevention of the pollution of streams flowing on the surface, and which, by the way, have never been traced to be the cause of disease, no one has thought of the great evils that have resulted, and will result, from the pollution of the underground sources of the water-supply."—*Baldwin Latham, loc. cit.*

and though the latter are amenable to sanitation, we know too little of the laws which govern the former to be able to attack them with much probability of success. And yet the very remarkable manner in which they recur, at somewhat regular periods, may and should serve to aid us in our efforts to prevent their spread. Dr. Ransome, of Manchester, England, has presented some striking illustrations of the cycles of recurrence of the epidemics of zymotic diseases, diseases which by their very class names might be supposed to depend exclusively on local causes. In a lecture delivered by this gentleman before the National Health Society in May, 1877, he exhibited diagrams representing graphically cycles that have been observed for upwards of a century by small-pox, scarlet-fever, and measles. They displayed in a remarkable manner the tendency of these diseases to recur in certain definite periods, and they showed, moreover, the difference between the course followed in densely peopled England and in the sparse population of Sweden. The period of recurrence for small-pox appears to have been six or seven years, that for measles five or six years, and scarlet-fever has a greater wave length of fifteen to twenty years, with lesser undulations of about five years. The sudden interference with the cyclical period of small-pox brought about by vaccination is clearly shown, so that Dr. Ransome is inclined to think that to point to these diagrams would be a sufficient answer to any anti-vaccinationist who presumes to doubt the efficacy of this means to arrest the spread of this horrible disease. "We ought," he says, "always to be on our guard against these disorders, but a knowledge of the curve that they usually follow ought to assist us in preparing to deal effectually with them at their periods of greatest prevalence."

He also considers as suggestive and instructive the curious fact that those epidemics which chiefly affect certain organs of the body are the most common at the season of the year when other non-specific affections of those organs are prevalent and in places most favorable to those diseases. Thus whooping-cough and measles generally attain their highest prevalence as epidemics in the winter and spring, when bronchitis and other affections of the air passages abound. Scarlet fever nearly always spreads most rapidly in autumn and occasionally in the spring, and at both these seasons relaxed and ulcerated throats are most common. And so for cholera and enteric fever, of which the maximum prevalence is in summer and autumn respectively, in accordance with an observation of Murchison that "circumscribed epidemics, or the ordinary autumnal increase of fever, are often preceded by a great increase of diarrhœa." "It may be," as suggested by Dr. Ransome, "that the weakness of particular organs affords an opportunity for the entrance of the epidemic poison which has an elective affinity for those organs, and we may be able to meet and to ward off attacks of epidemics by paying especial attention to the prevention of diseases that weaken or predispose those organs to attack." Dr. J. Sinclair Holden, in a paper read at the Congress of the Sanitary Institute of Great Britain, at Leamington, last October, aimed to show that careful investigation could usually discover the rule of law under all the apparent irregularity and caprice of contagion. He referred particularly to scarlatina, which had been mainly studied

in connection with severe cases. The mild cases, *always the most infectious*, were not so closely scrutinized and kept under sanitary supervision. Wherever an outbreak occurred a mild case was at the bottom of it; whereas where isolated cases cropped up and led to no other cases, the rationale given was that the mild cases shed an almost invisible poison dust from the skin, and were let loose on society in this stage, and because they were never really ill, little restraint was maintained. Hence the importance of converting the dry scaly dust into a moist controllable form, by frequent rubbing of the whole body, as soon as the faintest rash appeared, with oil or lard, this injunction being most imperative in the class of mild cases."

Two members of this Association, who have won honorable distinction by their zealous devotion to sanitary studies, have recently placed on record their apparently successful experience in attempts to control zymotic disease by prophylactic treatment. Dr. Ezra M. Hunt, my immediate predecessor as Chairman of the Section of State Medicine and Public Hygiene, has published two interesting and suggestive articles in the *Medical Record of New York*, for September 22d and December 8th, 1877, on the prevention of scarlet fever and diphtheria by individual sanitation. Dr. L. D. Waterman, of Indianapolis, in a short article in the *Practitioner*, of London, for March of the current year, states that his use of sulphurous acid administered on antizymotic principles has been strikingly successful.

Dr. E. J. Syson, a medical officer of health, in a well-written paper on the "Antiseptic Treatment of Zymotic Diseases," read before the Hunt's Medical Society, and published in *Public Health* for November 9th, 1877, puts in a strong claim for antiseptic medicine, and states that in 1866 he supposed himself to have discovered that it was impossible to vaccinate where the patient was thoroughly under the influence of arsenic, which induced him subsequently to see how far arsenic would exercise antagonistic influence to smallpox. In three cases the results quite confirmed his anticipations. Yet more decisive results were obtained by the use of the same agent, both as a curative and a prophylactic in cases of rinderpest.

Dr. E. B. Baxter, whose experimental studies of certain disinfectants, as recorded in the report of the Medical Officer of the Privy Council and Local Government Board for 1875, fully warranted his announcing some positive and some negative conclusions of more or less value, has quite recently expounded his latest views on the "Theoretical Aspects of Disinfection," in a paper read to the Society of the Medical Officers of Health. He justly, in my opinion, regards the evidence of the causal relation of septic microzymes to putrefactive changes to be now too strong to be disputed, which could not have been affirmed with certainty so late as three years ago. While abstaining from dogmatic assertions as to the completeness of the proof of the parasitic theory of communicable disease, and as to the vegetable nature of contagium particles, he yet recognized certain analogies between these contagia and the septic microzymes, and adds that "if it could be empirically ascertained that both stood in much the same quantitative relation to certain destructive chemical agencies, one might provisionally accept the generalization that germicidal was a measure of disinfectant power."

If, then, contagia were propagated only by *continuous* development, whether in the infected organism or in its excretions, in accordance with Budd's theory in regard to the contagium of typhoid fever, the outlook would, indeed, as suggested by Mr. Baxter, "be very hopeful, and we might even anticipate an approach to the *perfect* fulfilment of the work of disinfection, by subjecting all matters immediately after their removal from the affected person, and before any dilution or admixture, to the full influence of one or other among the destructive agencies at our command."

This result is feasible, and ought to be realized in the case of small-pox, scarlatina, and possibly some other zymotic affections, but unhappily this is not the case, as I believe, with typhoid and some others. That typhoid fever—I will not say may be *generated* spontaneously, for I believe it to depend on a living contagium, and I do not believe in the possibility of a spontaneous generation of living organisms—but that it may appear in a given place otherwise than by direct importation by either persons or fomites, has, I think, been placed beyond question. It would surely be unwarrantable to say that a case of typhoid had originated spontaneously, that is, that the contagium had originated *de novo* in the spot where it was manifested, until every possible channel by which it might have been introduced from without, either at or near the time, or at some not very distant epoch, had been excluded. In some of these cases it would appear that the contagion may be wafted in clouds of definite width over long distances, giving rise to true, wide-spreading epidemics, while in others there is reason to believe that germs long buried may be disinterred and be awakened into activity by upturning of the soil. It is obvious that in such cases artificial disinfection would be for the most part practically inoperative. For such modes of approach we can only oppose to the morbific agent such defensive measures as cleanliness, good ventilation, drainage, the use of uncontaminated water, wholesome food, and a brave cheerfulness of spirits.

CONTAGIUM VIVUM.

No other subject within the scope of sanitary inquiry has excited greater interest during the past year than that which is connected with the investigation of the nature of the contagious material of the infectious fevers. The doctrine of a *contagium vivum* has been recently assailed with earnestness and vigor by that able and zealous sanitarian, Dr. B. W. Richardson. Nevertheless, that doctrine has been steadily gaining ground, not only in the increasing number of its avowed adherents, but still more in the variety and significance of the analogies by which it is sustained.

It will be remembered that a little more than a year ago Dr. Burdon-Sanderson, who still holds fast to the doctrine of living contagia, seemed to give up the germ theory, in that he denied to contagium the attribute of structure in the anatomical sense, and maintained that, "so far as the morphologist is concerned, germs have quietly gone out of court, and given place to things which are ultra-microscopical—to molecular aggregates—of which all that we can say is, that they occupy the border-land between the living and non-living things." I have elsewhere commented upon the weakness of

the argument implied by this statement, as really resting upon no other basis than the limits of microscopic demonstration, and I cited the admission of its author that, "after all, contagium resembles an organism much more than it resembles a chemical body, for its characteristic behavior is such as, if it had structure, would prove it to be living. "What," he asks, "is more characteristic of living protoplasm than that while maintaining its own integrity it alters the surrounding medium?"

Assuming that the matter of contagium is identical with the "germinal matter" of bacteria, Dr. Sanderson endeavors to fortify his position as to the absence of morphological characters, by adverting to the fact that this germinal matter resists destructive influences which are fatal to the adult bacteria. Prof. Tyndall has shown that this argument is utterly without validity. He adverts, in a paper published in the Proceedings of the Royal Society of June 21st, 1877, to the well-known fact that the contagium of splenic fever appears under two forms, one of which is fugitive and readily destroyed, the other persistent and destroyed with difficulty. It had been shown by Koch, and also by Cohn, that the fugitive contagium is the fully-developed organism of *bacillus anthracis*, while the persistent contagium is the spore of that organism. So likewise the observations of Dallinger and Drysdale establish a great difference between the death temperatures of adult monads and monad germs. With a magnifying power of 5,000 diameters, these gentlemen demonstrated the production of spores by adult organisms, some of which organisms did not exceed the 1-5000 of an inch. The young spores were watched through to the adult condition, and it was found that, while a temperature of 140° F. was sufficient to cause the death of the adults, the spores were able to grow even after having been heated to 300° F. for ten minutes. "Can it be philosophical," asks Mr. Dallinger, "with the life history of bacteria still unknown, to assume it as a different method of propagation?"

Then as to the ultra-microscopical minuteness of the contagious particles, Prof. Tyndall argues with pertinency and force that "between the microscopic limit and the true molecular limit, there is room for infinite permutations and combinations," and he invokes the uniformity of nature to sustain his position that "a particle, whether great or small, which, when sown, produces a plant, is proved thereby to be the germ of that plant," certainly as defensible and rational a position as that of Dr. Sanderson, that a particle, however fruitful it may be, ceases to be a germ and "dwindles to a molecular aggregate" when it becomes ultra-microscopical.

Dr. Sanderson has, moreover, denied with emphasis that any experiments of Bastian or others have proved the possibility of spontaneous generation, citing his own experiments and those of Samuelson, Pfluger, and Prof. Tyndall in opposition to the inconclusive ones of Dr. Bastian. It was shown by the former gentlemen, as it had been shown several years ago by the late Dr. Jeffries Wyman, that an extension of the time during which the boiling temperature was maintained, or a slight elevation of the temperature above the boiling point, would, in all cases, completely sterilize any organic infusion. More recently Prof. Tyndall has thrown a flood of light

on the cause of the diversity of results obtained by different persons, or by the same party at different times in attempts to sterilize organic infusions. I have already alluded to the trustworthy observations of Dallinger and Drysdale on the remarkable difference between adult monads and their demonstrable spores in respect of the power of resisting heat. It occurred to Prof. Tyndall that as doubtless a similar difference existed between the finished organism and the germinal particles in the case of bacteria, so, too, the power of extreme resistance exhibited by the germ would probably be greatly lessened the nearer the germ is to its final sensitive condition. Seeds soften before and during germination, and assuming that this takes place in the germinal particles as preparatory to their development into the mature organisms, Prof. Tyndall determined to apply a crucial test. An infusion infected with the most powerfully resistant germs, but otherwise protected against the floating matters of the air, is gradually raised to its boiling point. Such germs as had reached the soft and plastic state immediately preceding their development into bacteria would thus be destroyed. The infusion is then put aside in a warm room for ten or twelve hours. If for twenty we might have the liquid charged with well developed bacteria. To anticipate this, at the end of ten or twelve hours we raise the infusion a second time to the boiling temperature, which, as before, will destroy all the germs then approaching their final development. The infusion is again put aside for ten or twelve hours, and the process of heating is repeated. By this method of discontinuous and repeated application of heat we kill the germs in the order of their resistance, and finally kill the last of them, by a temperature no higher than that of boiling water at the ordinary pressure, and maintained for only a few minutes at a time. "No infusion," says Prof. Tyndall, "can withstand this process if it be repeated a sufficient number of times." He applied it to infusions of a great variety of substances, including those most tenacious of life. Not one of them bore the ordeal. These results were clearly foreseen before they were realized, so that the germ-theory fulfils the test of every true theory, that test being the power of prevision.

The attack of Dr. Richardson on the germ theory of disease is far more uncompromising, his views being in direct opposition to the idea of there being a living and self-multiplying contagium. He contends that the poisons of the various communicable diseases are modified *secretions*, and these, though products of living organs, are not themselves living, but really dead matter, and that different diseases are caused by secretions of different glands.

These views relative to the glandular origin of contagious diseases were first promulgated in 1867, and, with a single exception relating to his alleged success in isolating the poison of septic matter, which he regards as a type of the contagia of all the communicable diseases. I believe that his twenty or more propositions laid down in his recent address as President of the Sanitary Congress at Leamington, have failed to meet with acceptance either on the part of the general medical public or with special investigators in the same department of pathological inquiry.

Dr. Burdon-Sanderson has shown, by his experiments on the

propagation of infective inflammations, that, in cases of putrid intoxication caused by the injection of septic matter from which the septic organisms have been previously separated, if the dose be not so large as to kill the animal in a few hours, there is usually a rapid recovery, *the septic poison not having the slightest tendency to multiply in the infected body*, provided that the access of microzymes be excluded. This presents a most remarkable contrast with the effects of the introduction of the contagia of the zymotic diseases, and the difference is full of significance. In like manner the observations of Dr. Satterthwaite, in concert with Prof. Edward Curtis, as reported in the paper read by the first-named gentleman before the International Medical Congress in Philadelphia, had reference chiefly to the poisonous matter of putrid infusions, and only showed what Burdon-Sanderson had already established, that this matter, capable of producing intense sepsis, is a chemical and not a living substance. Nevertheless, the latter has established another fact on equally incontestable experimental evidence, namely, that this chemical poison is the product of bacterial activity, and cannot be otherwise manufactured. The error of the germ-crazy folks, if error there be, consists according to him, "not in stating that bacteria are of pathological importance, but in asserting that because A produces B, and B produces C, therefore C cannot be produced unless A is present. It would be erroneous to say that the yeast plant is the agent in the production of the evils of intemperance, and it is a mistake to say that bacteria are the agents in the production of septicæmia; but just as if there were no yeast plant there would be no drunkenness, so if there were no bacteria there would be no septicæmia.

The septic poison we have seen to be an exclusive product of bacterial development,—a product which bacteria are capable of manufacturing from unorganized and perfectly harmless material,—a product which, although incapable of passing through certain kinds of filters, is soluble in the ordinary sense. Pathologically, we have seen that it does not act the part of a specific contagium; that, in order to the production of its morbific effects, a sufficient quantity must be introduced into the circulation; and, further, that the intensity of the effect is proportionate to the quantity introduced; so that if the amount be not too great, the tendency is to a favorable, not to a fatal, termination. But every one knows that there occur from time to time in clinical experience instances of a sort of septicæmia of a more virulent kind; cases, for example, of septic peritonitis, in which the quantity of the agent required to produce the fatal result is not measured by drops or grains, but (if one may so express oneself) in homœopathic doses; cases in which we at once recognize that we have to do, not with a poison of which the effect is determined by its quantity, but with a ferment of which the destructiveness to life is chiefly dependent on the rapidity of its development.

The inevitably fatal result of these malignant forms of septicæmia preceded by "diffuse suppurative infiltration of the cellular tissue" (pyæmia), surrounding the gateway of access by which the poison was introduced, and by delirium and collapse, "being partly, perhaps, due to the direct influence of the specific contagion, but

principally to the enormous development in the organism of the ordinary septic poison."*

While thus recognizing the fact that in simple septicæmia the microzymes are not the direct agents which produce the pathological results, we may justly enter a protest against the grave error of those who "maintain, in the face of all the experimental investigations relating to the subject during the last few years, that these organisms are without pathological significance." As Dr. Sanderson pertinently and justly remarks, "If these infinitely minute organisms are present in every intensely infective inflammation, we may be quite sure that they stand in important relation to the morbid process." He has further shown that bacteria grown in Pasteur's cultivating liquid, there being no putrid albumenoid matter present, are for the first crop inert, but eventually a product is obtained which possesses all the virulence of putrescent animal or vegetable infusions —a possible explanation being that the liquid becomes charged with the excretions of the bacteria or with the products of the decomposition of dead bacteria.

Now as to the doctrine of a *specific contagium vivum* for each of the specific fevers, I think it a sufficient answer to most of the objections urged against this doctrine, to remark that however plausible some of these objections may appear, they are at once refuted by the conceded positive demonstration of such a contagium in a single case, namely, splenic fever. Koch having ascertained that the *bacillus anthracis* produces spores when grown in the cultivating liquid, proceeded to test the pathogenic activity of rods and spores as thus produced. The inoculation of either rods or spores into a small incision in the skin of a mouse produced splenic fever in every instance. If the tested material caused no development of rods and spores in the incubator, it failed to produce splenic fever by inoculation. "Proof," says Dr. Roberts, "could go no further; the infection absolutely followed the specific organism—it came with it, it went with it. These observations were repeated with the strictest precautions at the Physiological Institute at Breslau, under the eyes of Prof. Cohn and other competent observers, who fully corroborated their exactness." The proof is likewise nearly complete in the case of relapsing fever. It is now generally known that the discovery by Dr. Obermeier, of Berlin, of minute spiral organisms in the blood of patients suffering from relapsing fever, has been fully confirmed by later observers. An elaborate monograph on this subject, by Dr. Heydenrich, of St. Petersburg, is quoted by Dr. Roberts in his Address in Medicine before the British Medical Association, in August, 1877. It is based on forty-six cases, which were studied with the most minute care, the blood being examined and the temperature being observed from two to six times each day. Altogether over a thousand examinations of the blood were made. Now the spiral organisms are found during the paroxysms; they disappear at the crisis, and are absent during the apyrexial periods. The fever is easily communicated to a healthy person by inoculation with the blood of a patient suffering from the

* Burdon Sanderson, Lectures on the Infective Processes of Disease. *British Medical Journal*, February 9th, 1878.

disease, but the blood is only infective during the paroxysms, when it contains the organisms, but not at the crisis nor during the apyrexial periods, when they are absent. None of the fluids or secretions of the body except the blood are infective, all of which seems to show that the virus is associated with spirilla.

The fact that the organism lives in the blood in this fever furnishes thus a perfectly satisfactory explanation of the absence of local lesions which distinguishes it from the eruptive fevers. It does not so satisfactorily explain another distinctive peculiarity, namely, the lack of a protective influence of a first attack against a recurrence of the disease, although it is urged by Maclagan that it is reasonable to believe that a permanent impression may be more readily produced on a formed and stable organ than on a constantly changing fluid like the blood, and that a contagion which finds its second factor in an individual organ or tissue is, therefore, more likely to produce a permanent impression than one which finds its second factor in the circulating fluids.

These facts relating to splenic and relapsing fevers, as furnishing a positive demonstration of the doctrine of *contagium vivum* in its application to those particular diseases, sweep away the objections urged by Dr. Richardson and others against that doctrine in general, and leave us free to accept general analogies as legitimate data for making a provisional assumption of a similar contagium in the case of other infectious fevers in which disease-producing organisms have not yet been detected.

The theory which ascribes the phenomena of the infectious fevers to the agency of living parasites had floated before men's minds in a vague way for many centuries. It was not, however, until about the middle of the present century that there had been observed a sufficient body of appropriate facts to entitle it to be ranked as a legitimate hypothesis, when Henle, in Germany, Dr. J. K. Mitchell, in Philadelphia, and a Dr. Cowdell, in England, nearly about the same time and quite independently of each other, promulgated very pronounced opinions on the subject, and defended them with an imposing array of striking facts and ingenious and plausible arguments. Liebermeister says of Henle that he elaborated the theory of a *contagium vivum* in 1853, with as much modesty as thoroughness, though even as early as 1840 he had maintained it with convincing logic.

Dr. Mitchell's lectures on the cryptogamous origin of malarious and epidemic fevers, delivered at the Jefferson Medical College during the session of 1846–47, and subsequently published in compliance with the request of the class, attracted general attention and elicited strong expressions of commendation from distinguished members of the profession, especially from the late Dr. Daniel Drake, then engaged in the preparation of his great work "On the Diseases of the Interior Valley of North America." About a year later, and apparently without any knowledge of Dr. Mitchell's essay, Dr. Cowdell, of London, published "A Disquisition on Pestilential Cholera, being an attempt to explain its Phenomena, Nature, Cause, Prevention and Treatment by Reference to an Extrinsic Fungus Origin." A contemporary critic in the *British and Foreign Medico-Chirurgical Review*, in a commendatory notice of Dr. Cowdell's

book, advised him to extend his hypothesis to all epidemics, suggesting that "he would perhaps find yellow fever and the plague still more to his purpose than cholera." It was not, however, until after the publication of Pasteur's researches on fermentation and putrefaction, within the last twenty years, that the germ theory, previously regarded as at most a plausible conjecture, began to be treated as a serious pathological doctrine, being warmly advocated by leading minds in the profession, though as earnestly opposed by others of equal standing and authority. The subsequent discovery of specific organisms in the blood and tissues of animals suffering from splenic fever, and in the blood of human beings affected with relapsing fever, gave an immense impulse to the spread of this doctrine, which now counts among its adherents many of the leading minds of the profession, and which is supported by analogies of great variety and significance. The latest systematic exposition of these analogies which I have seen is given by Dr. Wm. Roberts, of Manchester, in an admirable address before the British Medical Association, held in that city in August of last year. This address has been published *in extenso* in the *British Medical Journal* and in the *Medical Times and Gazette*, of London, August 11, 1877, and contains, besides a summary of previous observations by others, some original experiments by the author himself. The object of some of these experiments was to indicate a curious resemblance between the action of yeast and the phenomena of a contagious fever, and of others, to confirm the conclusions of Pasteur and Tyndall, that organic matter has no inherent power of generating bacteria, and no inherent power of passing into decomposition, but that bacteria are the actual agents of decomposition, and that they owe their origin exclusively to parent germs derived from the surrounding media. In addition to the experiments relating to this latter point, he further fortifies his conclusions by an argument based upon a striking generalization, which is, I believe, at least in the application of the fact, original with himself. "Saprophytes," under which general designation he includes all the organisms associated with the decomposition and decay of organic matter, "are," he says, "as is well known, destitute of chlorophyll, and, like all such plants, they are unable to assimilate carbonic acid. They obtain their carbon exclusively from more complex compounds which have been prepared for them by preëxisting living beings." This, of course, was a familiarly known fact, but Dr. Roberts has sagaciously drawn the conclusion that it is manifestly impossible that the primordial forms of life could have belonged to this group; "for, if we throw ourselves back in imagination to that remote era when life first appeared on the globe, we should find ourselves in a purely inorganic world—amid conditions in which saprophytes could not possibly live nor obtain nourishment. The special function of the saprophytes in the order of nature is to destroy, not create, organic matter; and they constitute not the first, but the last link in the biological chain. For, if we regard the order of life as it now proceeds on the earth's surface, we may describe it as beginning with the chlorophyll body, and ending with the saprophyte. The chlorophyll body is the only known form of protoplasm which obtains all its nutriment from inorganic sources. . . .

"If ever I should be privileged to witness an abrogenic birth, I should certainly not expect to see a saprophyte; I should rather expect to see a speck of protoplasm, slowly formed, without definite shape or dimensions, and nourishing itself, like the chlorophyll body on a purely mineral diet. The more one reflects on this subject, the more clearly does it appear that the spontaneous origin of saprophytes is impossible. Speaking as an evolutionist, I should rather infer that saprophytes were a late development—probably a degradation from some algal forms, which had found their profit in feeding on waste organic matter, and which gradually lost their chlorophyll through want of use, and with it their power of feeding on an exclusive mineral diet."

It has been shown, both by those who affirm and those who deny the doctrine of a contagium vivum, that there is no constant and easily recognizable distinction between septic organisms which produce the poison of putrid fever and the common bacteria of putrefaction; and it is affirmed by Cohn that the *bacillus anthracis*, the deadly contagium of splenic fever, is identical in form and development with the *bacillus subtilis*, a harmless saprophyte, the only difference he could detect being that the rods of the former were motionless, while those of the latter exhibit movements. The same authority has shown that the so-called spirillum of relapsing fever is really a spirochæte, a genus distinguished from spirillum by exhibiting—in addition to serpentine movements, by which they are enabled to change their place—an undulation passing along their whole length, which has never been observed in spirillum. He has further shown that the relapsing fever species (*S. Obermeieri*) is almost, if not quite, identical in form and botanical character with the *spirochæte plicatilis* of Ehrenberg, a species found in dirty water, from which it is conceivable that it may be taken into the human system.*

Those who find in such facts as these, evidence of the falsity of the germ-theory, commit, therefore, an obvious fallacy, inasmuch as the apparent identity in anatomical character may be consistent with a complete diversity in pathogenic properties, whether this difference depends upon a peculiar state of the system giving rise to a pathological infectivity as a necessary factor in the production of the disease in addition to the inoculation of the living contagium or whether it depends upon changes in the nature of the organisms analogous to those which are observed in both the animal and vegetable kingdoms, in connection with the development of permanent varieties. This latter hypothesis is suggested by Dr. Roberts, who at least makes it clear that it rests upon the assumption of a *vera causa*, which is also appropriate to the effect which it is invoked to explain. "If," he says, "contagia are organisms, they must necessarily possess the fundamental tendencies and attributes of all organized things. Among the most important of these attributes is the capacity for 'variation' or 'sporting.' This capacity is an essential link in the theory of evolution, and Darwin brings forth strong

*Abstract of Recent Researches into the History of Bacteria, made by and under the direction of Prof. Cohn, of Breslau. By P. Jeffrey Bell.—*Microscopical Journal, July,* 1876.

grounds for the belief that variation in plants and animals is not the result of chance or caprice, but is the definite effect of definite (though often quite obscure) causes. I see no more difficulty in believing that the *bacillus anthracis* is a sport from the *bacillus subtilis* than in believing, as all botanists tell us, that the bitter almond is a sport from the sweet almond—the one a bland, inocuous fruit, and the other containing the elements of a deadly poison.

"Cholera suddenly breaks out in some remote district in India and spreads from that centre over half the globe. In three or four seasons the epidemic dies away and ceases altogether from among men. A few years later it reappears and spreads again, and disappears as before. Does not this look as if the cholera virus were an occasional sport from some Indian saprophyte, which by variation has acquired a parasitic habit, and having run through countless generations either dies out or reverts again to its original type? Similarly typhoid fever might be explained as a variation from some common saprophyte of our stagnant pools or sewers, which, under certain conditions of its own surroundings, or certain conditions within the human body, acquires a parasitic habit. Having acquired this habit it becomes a contagious virus, which is transmitted with its new habit through a certain number of generations; but finally, these conditions ceasing, it reverts again to its original non-parasitic type." How admirably this ingenious theory reconciles the observations of Murchison and others on the occasional pythogenic origin of typhoid fever with the doctrine of a contagium vivum, and harmonizes them with the deductions of Budd as to the continuous development of this fever, it is needless to insist.

When we thus find innumerable analogies between the phenomena of the contagious fevers and those connected with the development and life of certain low organisms, analogiesn so umerous and so close that every peculiarity in the manifestation of the fevers as to mode of development and spreading will be found to be susceptible of interpretation in terms of the doctrine of a *contagium vivum*, and many of them not susceptible of any other explanation; and that, moreover, a positive demonstration has, it is universally conceded, been given in the case of splenic fever, not to insist upon the almost equally conclusive proof in the case of relapsing fever and septicæmia, nor upon the apparently conclusive demonstration given by Chauveau, and subsequently confirmed by Sanderson and by Braidwood and Vacher, that the contagium of vaccinia and variola consists of transparent vesicles, first recognized by Lionel Beale, not exceeding, according to Sanderson, the 1-20000 inch in diameter, it does appear to me that a very strong case has been made out in proof of the general doctrine in question.*

They who are prone to reiterate the assertion that no positive demonstration has been given of a living contagium in the case of typhoid, typhus, or the malarial fevers, and who seem to take for granted that until such demonstration has been given it is more logical to doubt, if not to deny, the possibility of such a mode of causation, than to hold it as a provisional hypothesis, forget that ocular demonstration may be absolutely precluded by reason of an

British and Foreign Medico-Chirurgical Review, October, 1877, p. 393.

ultra-microscopical minuteness of the particles; that, however, between the microscopic and molecular limits there is space for countless gradations of beings; and that, after all, inferential proof may be quite as conclusive as sensible demonstration—in some cases, indeed, much more so—the liability to commit logical fallacies in the one case being balanced or more than balanced by possible errors of interpretation in the other. What would be thought of the scientist who would doubt, not to say deny, the truth of the undulatory theory of light on the ground that the supposed elastic medium, whose motions are believed to constitute the light of the universe, is itself invisible, impalpable, and absolutely imponderable—that we cannot demonstrate its presence nor know anything of its essential nature? The assumption of its existence, suggested by observed analogies between many of the phenomena of light and the known effects of the undulations of ponderable fluids, not only furnishes a satisfactory explanation of all the previously known facts, but has enabled competent philosophers to predict and thus to discover other more recondite phenomena which had eluded direct observation. No proof could be stronger than this. In like manner, the extension of the doctrine of a contagium vivum from those infectious fevers in which positive ocular demonstration of its presence has been given to others of the same class, in regard to which ocular demonstration may be precluded presumably by reason of the extreme minuteness of the particles, is fully justified by the uniformity of Nature.

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Good health is to teachers their chief capital stock, without which all other investments in professional power are of little value. The demands upon this vital capital are so constant and pressing that the holder is liable to lose his possessions ere he is aware of it, and before he has reached the meridian of life and usefulness. The trouble lies not so much in the mere work of teaching as in the worry, fret, and nervous strain which keep the teacher constantly unduly exercised in the regions of the brain, and too little occupied in pursuits which send the blood back through the extremities, the lungs, and the heart. As a result, we find our teachers suffering, first from dyspepsia, then from sleeplessness, then from severe headaches, and flushed faces by day and by night; then comes on a whole troop of diseases, not singly, but by companies, to take possession of the body which has suffered the invaders to enter, without his knowledge at first, but, having gained possession of the citadel, are kindred and allies to the great body of foes without, who now clamor for an easier entry, and, in nine cases out of ten, unless great care is taken, will gain their point. The figure aside, "the teacher breaks down," and his first effort to restore his health is by an alliance with the neighborhood physician, who, may be, prescribes chloral for sleeplessness, and some stimulus of food or drink for the troubles of the stomach, nerves, and brain. The very things that ought not to be done are done, and the sufferer makes a temporary improvement in feeling, only to be made really worse in fact. Now, there is a better way out of these physical ills than through physicians' medicines, of whatever sort, and every teacher should know how to return to the good old ways of health and happiness. "Dr. Diet, Dr. Quiet, and Dr. Merryman" are among the best physicians of the old school and the new.—*N. E. Journal of Education.*

SEWER COMMUNICATIONS AND FILTH DISEASES.

Dr. JAMES B. RUSSELL, the Medical Officer of Health for Glasgow, in a paper recently read before the Philosophical Society of Glasgow, has made a valuable contribution to our knowledge of the effect of sewer-gas upon the production of enteric fever and diphtheria, two of the most clearly defined filth diseases. It appears that since 1873 every fatal case of any zymotic disease or of lung-disease in Glasgow has been entered on a card, upon which has also been recorded, after inquiry, "minute details about the size of the house, the position of the water-closet, if there be one, and also of the ash-box or sink." During three and a half years, ending December last, 420 fatal cases of diphtheria and 833 of enteric fever have been dealt with in Glasgow on this detailed card system, and form the basis of Dr. Russell's investigation, undertaken with a view to calculate the effect of sewer communication in the production of these diseases. For this purpose the houses in which these deaths from enteric fever and diphtheria were recorded were divided into four classes: (1) those having a water-closet inside, with or without a sink; (2) those having a sink inside, but no water-closet; (3) those having no connection whatever between their internal atmosphere and the sewers—that is, having neither water-closet nor sink; (4) and those concerning which, from the addresses not being found or other causes, the information was not obtained. The investigation, for reasons which it is here unnecessary to dwell upon, was confined, so far as it deals with the influence of sewer-gas, to houses of one and of two apartments. The total number of houses of each size in the city was obtained from the City Assessor's annual assessment roll; and the proportion of the houses of each of the four classes above mentioned was determined from a return called for by Dr. Fergus in 1872, showing the numbers and the class of the houses having water-closets, drains, etc., in communication with the sewers. In order to ascertain the number of persons living in these houses of different sizes, Dr. Russell assumed that the average number of the inmates of the houses in each class prevailing at the census in 1871 is still maintained. It may be stated that, in one way or other, the internal atmosphere of fully 33 per cent. of the one-apartment and 69 per cent. of the two-apartment houses was in communication with the sewers.

Dr. Russell set himself to answer the following questions: Does it make any difference to the inhabitants of a one- or two-apartment house, whether there is or is not a communication between the house-air and the sewers? Are the residents of these houses, or are they not, more liable to be fertilized with the germs of these two special filth diseases? The number of houses of one apartment having an internal water-closet was too small to afford a trustworthy basis for calculation; but, among those persons living in

houses of one apartment having no communication with the sewers, the death-rate per million was equal to 120 from diphtheria, and to 249 from enteric fever; whereas, among the residents of one-apartment houses containing a sink communication with the sewer, the rate from diphtheria was equal to 253, and from enteric fever to 677, per million. So, in the houses of two apartments having "no direct means of access for the specific germs," the rate from diphtheria was 127, and from enteric fever 386, per million; in those having a sink, the rates became 275 and 465; while in those having an inside water-closet in addition to the sink, the death-rate from diphtheria rose to 418, and from enteric fever to 665, per million. Thus it seems to be proved that in Glasgow, during these three years and a half, the lowest death-rates from diphtheria and enteric fever occurred in those houses of one and of two apartments having no communication with the sewers; while the highest rates were found in those houses of two apartments which were provided both with water-closets and sinks. The mortality from each of these diseases was, however, found to be still higher in houses of three apartments; but, as the proportion of this class of houses provided with sewer communications is unknown to Dr. Russell, he was unable to deal with their statistics so completely as he did with those of one and two apartments. As, however, the proportion of internal sewer-communications rose from 33 per cent. in the houses of one apartment to 69 per cent. in houses of two apartments, it is only reasonable to assume that three- and four-apartment houses are still more fully provided with internal sewer communications. Hence, probably, the still higher death-rate from these diseases, the specific germs of which conclusively appear to be distributed by sewer-gas. Dr. Russell expresses his conviction, which is fully warranted by his carefully compiled statistics, that it is the absence of the sewer connection by sink and water-closet with the internal atmosphere of a large proportion of the one- and two-apartment houses which causes the death-rates from diphtheria and enteric fever to be lower in these than in larger houses. He further says: "If every house of each size were connected alike with the drains and sewers, then I am sure the diseases specially associated with such misplaced connections would conform to the general law of other diseases, and be at their maximum in the smallest houses."

Dr. Russell concludes his valuable paper by stating that, if we would reduce the mortality from diphtheria and enteric fever to the "lowest possible minimum," not only must all internal communications with the sewers be as far as possible abolished, but our sewers and house-drains must be ventilated on the separate system, and the use of cistern-water for dietetic purposes must be entirely discontinued. There is no reason to doubt that what Dr. Russell has proved with regard to the mortality from diphtheria and enteric fever in Glasgow is more or less true with regard to their mortality in other sewered towns. It is, however, to be feared that but few medical officers of health have provided themselves with the materials for so valuable an investigation as that which has been so carefully elaborated by the indefatigable Medical Officer of Health for Glasgow.—*British Medical Journal*, May 11th, 1878.

EXPLOSIVE DUST.

The American Miller, in a recent discussion of the causes of Flour Mill Explosions, remarks:

"Not only is there no essential difference in the explosive character of different kinds of flour dust, but other substances, equally as harmless in themselves as flour, become explosive when diffused in a cloud. Witness the destruction of the candy factory on Barclay street, in New York city, by an explosion and fire that took place last December. Any inflammable substance contains within itself the requisite materials for an explosion if the circumstances are favorable. Fine particles of cotton, wool, or any other similar material, if floating in the air in sufficient quantities to ignite quickly on the application of heat, are all explosive, or rather supply the conditions for an explosion. If any solid inflammable substance be reduced to powder and diffused through the air in such a manner that each particle has sufficient oxygen to enable it to burn under the most favorable circumstances, the application of heat will cause an explosion more or less violent. If the dust is diffused through an atmosphere confined within restraining limits, the explosion may be quite as terrific, proportionately, as that which destroyed the Washburn mill. Richards has the following in one of his works: "The inflammable and explosive nature of wood dust is not generally known, but few being aware that it is a fulminate, like gunpowder. Any dust of combustible material, even that of cast iron, when floating or thickly distributed in the air, explodes or burns up with great force. To prove this, let any one hold a candle beneath a girder or beam in a wood shop, and sweep off the fine dust from its top so as to fall on the light, and they will be convinced of its explosive nature."

In directing attention to the subject of explosions, the *Northwestern Lumberman*, of Chicago, speaks as follows: "Wherever there are liable to be accumulations of fine dust there is danger of an explosion; and it must be admitted that in wood-working factories, and particularly those converting dry material, it is rare indeed that dust is not to be found in abundance. It is true there have been but few if any fires in wood-working factories traced directly to this cause; but it will not do to argue from this that none have occurred. A large proportion of the fires in planing mills, and similar institutions, are of unknown or accidental origin, and it is far from unreasonable to suppose that many of them would be found, if it were possible to investigate the matter, to have been the result of explosions of this character. There are many ways in which the necessary combination of dust and air might be effected, and the fire to ignite it supplied, while the chances of discovering just how it was done after the mill is destroyed are very small indeed."

We quote the above opinions to show that an explosive character

is not peculiar to flour dust, but common to all substances which have an inflammable nature. It is well to remember this fact when alarmists are attempting to show that flour mills are little better than powder mills, so far as safety is concerned. It is doubtless true that New Process milling, by making finer and drier flour, and making a greater number of separations, may materially assist in bringing about explosions; but the conditions may exist quite as well in any mill where dust and air are mingled in certain proportions in a confined atmosphere.

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"There is Dust on your Glasses."—I don't often put on glasses to examine Katy's work, but one morning not long since I did so upon entering a room she had been sweeping.

"Did you forget to open the windows when you swept, Katy?" I inquired; "this room is very dusty."

"I think there is dust on your eye-glasses, ma'am," she said modestly.

And sure enough the eye-glasses were at fault, and not Katy. I rubbed them off, and everything looked bright and clean, the carpet like new, and Katy's face said: "I'm glad it was the glasses, and not me this time." This has taught me a good lesson, I said to myself upon leaving the room, and one I shall remember through life.

That evening Katy came to me with some kitchen trouble. The cook had done so and so, and had said so and so. When her story was finished, I said, smiling: "There is dust on your glasses, Katy, rub them off, you will see better."

She understood me, and left the room.

I told the incident to the children, and it is quite common to hear them say to each other: "Oh, there is dust on your glasses."

Sometimes I am referred to: "Mamma, Harry has dust on his glasses; can't he rub them off?"

When I hear a person criticising another, condemning, perhaps, a course of action he knows nothing about, drawing inferences prejudicial to the person or persons, I think right away, "There's dust on your glasses; rub it off."

The truth is, everybody wears these very same glasses, only the dust is a little thicker on some than on others, and needs harder rubbing to get it off.

I said this to John, one day, some little matter coming up that called forth the remark. "There are some people I wish would begin to rub, then," said he. "There is Mr. So and So, and Mrs. So and So, they are always ready to pick at some one, to hint; I don't know, I don't like them."

"I think my son John has a wee bit on his glasses just now."

He laughed, and asked, "What is a body to do?"

"Keep your own well rubbed up, and you will not know whether others need it or not."

"I will," he replied.

I think, as a family, we are all profiting by that little incident, and through life will never forget the meaning of—"There is dust on your glasses."—*Maud Manning, in N. Y. Observer.*

CONTAGIOUSNESS OF PHTHISIS.

Twelve months ago we published our conclusions on the contagiousness of tuberculosis, and the danger of communicating it by the digestive organs.* Those conclusions are more and more strengthened by continued observation and the researches of other persons, and particularly the following notice of a paper by Dr. Tappenier, read at a meeting of German naturalists and physicians, at Monaco, translated from *Lo Sperimentale*, of January, 1878, which we clip from *The Canada Lancet:*

All physicians have observed cases of phthisis rapidly developed in individuals who had for a long time attended on patients in this disease, even when such attendants had not presented any predisposition, either individual or hereditary. Dr. Tappenier believes that the explanation of the fact is to be found in the inhalation of the expectorated matter, scattered in the air by the coughing of patients. In order to test this opinion, he made experiments, by intimately mixing a certain quantity of the sputa in a little water; he pulverized this emulsion by an appropriate process, and subjected some animals to the inhalation of the substance during one or two hours every day. These experiments were made in the Anatomico-Pathological Institute of Prof. Buhl, of Monaco. Dogs were selected, as animals presenting the least predisposition to contraction of the disease. Three perfectly sound dogs were put into the pen of the institute; the pen is situate near a window, and is closed in all parts, excepting above, where it receives the external air, through a door which is furnished with a fastening. Some sputa was obtained from a patient in phthisis, a spoonful of which was mixed in a quantity of water sufficient to make of it a liquid similar to almond milk, and every day pulverization of this was made in the pen during an hour, or an hour and a half. At the same time, for the purpose of studying absorption, by the digestive system, of the tuberculous matter, two of the dogs were made to swallow a certain quantity of it, from the same patient.

The whole five dogs had apparently a good appetite, and presented neither cough nor diarrhœa; they ate freely, and were cheerful and nimble, without any symptoms of illness, unless a slight wasting and arrest of development. At first view, therefore, the experiments gave a negative result. But the day preceding the first autopsy, a little finely powdered carmine was mixed with the tuberculous liquid, in order to discover how far it had penetrated into the respiratory passages. Two of the dogs subjected to inhalation, and the two which had swallowed the tuberculous mixture, were killed six weeks after the commencement of the experiment. The autopsy of the fifth had been made at the end of three weeks.

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* THE SANITARIAN, Vol. V., p. 337, *et sequentes.*

The results of the autopsies were surprising. The five dogs presented a general miliary tuberculosis of both lungs, of the liver, the kidneys, and (at least in the two that had swallowed the tuberculous matter) of the digestive apparatus. The numerous stains of carmine which were seen on the pulmonary surface showed that the inhaled liquid had penetrated into the pulmonary cells. The microscopic examination made by Prof. Buhl established in the clearest manner the reality of the lesions.

It has therefore been established experimentally that in the dog a general miliary tuberculosis can be induced from the inhalation or the ingestion of the matter expectorated by a phthisical patient. The possibility of contagion of phthisis through the natural channels may therefore be concluded.

The hygienic and clinical consequences of the experiment are of high importance. And first of all it is to be noted that those dogs continued in apparent sound health, despite the existence of general miliary tuberculosis. It is therefore possible in man a miliary tuberculosis may rest latent during a certain time, and may not become a real and declared phthisis before the development of foci of inflammation. But that which is of chief importance is the possibility of transmission of tuberculosis from man to man.

In ordinary conditions, that is to say in fresh and frequently renewed air, the matters expectorated and suspended in the air may not become sufficiently concentrated to have the power of inducing tuberculous infection. But when a certain number of phthisical patients reside together, and through fear of cold or of draughts the place is but little or not at all ventilated, may we not feel that the expectorated matter will accumulate sufficiently to become dangerous to healthy persons living in the same quarters? Ought we not, therefore, in this regard to take precautions, sometimes neglected, particularly in the wards of hospitals? Is it not perhaps prudent to recommend to consumptives never to swallow the matter brought up from cavities, which may have a deleterious influence on the digestive canal? Finally, may not these experiments in some degree explain the transmission of phthisis from husband to wife, or *vice versa*, and consequently the advisability of avoiding conjugal intercourse?

A Singularly Fatal Occupation.—The statement has been made by a Sheffield (England) physician, that the fork-grinders' employment is probably more fatal to human life than any other pursuit in England. According to this authority there are generally from eight to ten individuals at work in the room in which this industry is carried on; and the dust which is created, composed of fine particles of stone and metal—the grinding being always performed on dry stone—rises in clouds, and pervades the atmosphere to which the operatives are confined. The dust, which is thus every moment inhaled, gradually undermines the vigor of the constitution, and produces permanent disease of the lungs, accompanied by difficulty of breathing, cough, and a wasting of the animal frame, often at the early age of twenty-five; and the average longevity of fork-grinders is found not to exceed thirty years.

THE MODE OF INFLICTING THE DEATH PENALTY.

By JOHN H. PACKARD, M.D., of Philadelphia.

Proceedings of the New York Medico-Legal Society, April 3d, 1878; Hon. Geo. H. Yeaman, President, in the Chair.

Much as Christianity and modern civilization have done for human nature, they have not so far refined and purified it as to warrant the abolition of the death-penalty for the crime of murder. At least such seems to be the plain inference from the current history of our time. Without dwelling upon the daily reports of violence and ruffianism, certainly not growing less numerous or milder in form, I would mention the fact that a London telegram, of March 14th, says that a bill to abolish capital punishment was, on that day, put on its second reading, in the British House of Commons, and defeated by a vote of 263 to 64.

Another item, within a day or two, was to the effect that the death-penalty was to be restored to the statute-books of the State of Iowa, the experiment of dispensing with it having proved a failure.

I am well aware that much has been and may be said on what seems to be the humanitarian side of this question, which, indeed, is too large to be entered upon here, even if it came within the purpose of the present paper, or if I felt myself capable of handling it. Let me, however, venture to call attention to the fact that in the Mosaic history the Divine edict, "Whoso sheddeth man's blood, by man shall his blood be shed," was given as a distinct and separate utterance, anterior to any system of temporary or ceremonial law, and without any hint of limitation by time, or by circumstances which might arise in the later history of the race.*

As matter of fact, in almost all civilized communities, it ordained that the deliberate taking of human life shall involve the forfeiture of the life of the offender; the object being to prevent crime by the fear of punishment.

But there are two entirely different standpoints from which to view this matter. One is that taken by the degraded ruffian, who looks upon law and order as oppressive shackles, to be resisted whenever there is a chance of doing so successfully,—who regards his being as a sort of struggle with society,—and if in this warfare he is brought to the gallows, accepts his defeat as he would the loss of a prize-fight. He is overpowered by superior odds, but not conquered; and if he "dies game" he is a hero in the estimation of his compeers. The other is the point taken by the moral and self-

* A recent number of an English periodical (I regret that its name has escaped my memory, and that I have failed to find it by such search as my time has permitted) contained a very forcible *résumé* of the existing reasons for the retention of the death-penalty,

respecting part of the community; in this point of view the punishment is in the condemnation—in the ignominy of forfeiture of the right to live.

These two points, although thus stated separately, are extremes between which there are various grades; and the phrase, "the fear of punishment," expresses the combination of the two, which operates to preserve the security of life in communities.

Of course the mere terror of physical death is combined with the double aspect of capital punishment just mentioned, to a greater or less degree, in very many minds. In some it would swallow up all considerations of defiance of society, of disgrace, or of distress to relatives, etc. But this is an element which is not, and cannot be, recognized in any legal view of the matter. If it were not so —if the pain of physical death has anything to do with the deterrent effect of capital punishment—then it would be better to restore all the fearful list of tortures, burning, breaking on the wheel, and the rest.

I think it may be stated positively, without fear of contradiction, that just so far as the physical terrors of execution are enhanced, the moral force of the procedure is weakened. This is true in regard to its effect upon even the lowest and most brutal classes of society. It is the calm, dispassionate, inexorable working of retributive justice which holds them in check, so far as fear of punishment can do so.

The subject of the modes of carrying out the extreme sentence of the law was brought before this Society some years ago by Dr. Alonzo Calkins, in an able paper entitled "Judicial Executions for Capital Crimes."* The ground taken by him was adverse to the mode now in use in this country and in Great Britain; and his forcible exposition of its objectionable features, leaves nothing for me to say in regard to this portion of the topic. His views must be shared by all in whom the finer sentiments of humanity have not been blunted by actual contact with cruelty and vice.

While, however, I have nothing to say as to the mere process of death by hanging, there are some matters connected with it to which I would allude.

The strong feeling which exists in many minds against this mode of judicial death often adds to the difficulty of procuring convictions, even upon very positive evidences of guilt. It also adds very much to the force of the sympathy which is apt to be developed for criminals under sentence, and increases the frequency of pardons, by which the salutary effect of the law is seriously lessened. Under this head may be mentioned the facilitating of the abuse of the pardoning power, for political or private reasons, since this would be less likely to occur if it did not fall in with public sentiment.

(There is a curious usage in the State of Pennsylvania, and perhaps in other States also, by which, if the Governor in whose term a convicted murderer is sentenced goes out of office without signing the death-warrant, his successors likewise abstain from doing so. A man was recently liberated who was sentenced twenty-six years

* Published in the *Quarterly Journal of Psychological Science* for April, 1869.

ago, but the sentence was never carried out for the reason just stated. So far as I can learn, it is a mere usage, without any sanction by legal enactment.)

Between hanging and the other modes of execution at present in use in civilized countries, there is really no choice. They are all alike in affording an opportunity for bravado on the part of the criminal, and in the appearance, at least, of unseemly violence on the part of the officers of the law.

The ignominy of death on the gallows has always been regarded as one of its chief terrors; yet the body only is affected by it, and the stigma is merely conventional. Popular clamor or partisan hatred may condemn a pure-minded patriot to this, so-called, shameful ending, and yet succeeding generations will only the more honor and cherish his memory. The infamy comes from the judicial character of the act, from the fact that the man himself, by reason of his crimes, is declared by his fellow-men to be unworthy of existence among them.

Some of our State Legislatures have followed the example of the British Government in ordaining that all executions shall be carried out in private; but in many parts of the country the spectacle of a "hanging" is still allowed to have its brutalizing effect upon all who choose to come to see it.

Within forty-eight hours of the time of writing these lines the telegraph informs us of the hanging of a colored man, for murder, in a town in Tennessee, which was witnessed by ten thousand persons. And in the newspapers of this morning occurs the following item:

"Gus Johnson was hanged at Atlanta, Ga., yesterday, in the presence of a large crowd, for the murder of a colored ferryman. He showed brutal indifference, confessed that he had committed four murders, and ascended the scaffold with a cigar in his mouth."

I make no comment upon these two statements, except to record my solemn belief that the mere reading of those few lines which constitute the second one has already sown the seed of evil in the minds of thousands of the young and half educated, all over this country, which will come up with the rest in the great crop of crime.

But even where executions are supposed to be private, they are so only in name. They are, indeed, carried on *within* the walls of a prison; but a great many persons manage to get admission as deputy-sheriffs, or on some other pretence, and at every such scene the reporters of the daily press are present in force, as if by right, to vie with each other in giving graphic and—to use the detestable word of the day—"sensational" accounts of the miserable affair. By their agency the public, young and old, far and near, are enabled to gloat over details which cannot but be loathsome to the better part of human nature; which have a fearful fascination for the young and inexperienced, and which have unquestionably been widely influential in promoting crime.

I appeal to all to whom these words may come, whether they are not conscious of the harmful effects of such reading upon themselves?

Now, in view of the general admission that the present mode of inflicting the extreme penalty of the law is objectionable, an apology can hardly be needed for an attempt to point out a better way.

What I would suggest is that there should be fitted up, in the jail, a small room, which can be made air-tight. By means of very simple arrangements carbonic oxide can be substituted for the air of the room, and a person confined in it would thus die the easiest and quietest death known to science. He would simply cease to exist.

A jury should be appointed to identify the convicted person. In their presence he should be conducted to the room, and placed in it, entering by a sliding door—of plate glass it may be—protected by netting of iron wire. The process of rendering the air irrespirable should then be begun, and would very soon be completed. In less than ten minutes fresh air might be introduced by opening the sliding-door and reversing the former process; and the same jury, again identifying the body, could certify to the fact of the execution having been duly carried out.

In 1874 Mr. Coleman Sellers suggested the adoption of this carbonic oxide poisoning as the method of killing the dogs taken up in the City of Philadelphia, and unredeemed; and it has been found to answer the purpose perfectly. By the kindness of Mr. Marett, the Superintendent of the Dog-shelter, I have inspected the process more than once. At my last visit I carefully timed its duration, and found that of forty-three dogs of various sizes introduced into the room, the air being pure, every one had ceased to breathe three minutes after the gas began to flow. Two dogs, weighing about 45 pounds each, were put in singly, and the time was exactly the same for both—110 seconds.

More exact details of the method can readily be furnished, if desired. It is essentially the same as that within a few years so often adopted by suicides in France. To my own mind it presents many advantages on the score of humanity, propriety, and efficiency.

Dogs killed in this way manifest scarcely any evidence of suffering—not more than I have seen in inducing anæsthesia by ether, in other dogs, for the purpose of surgical operations.

The death would necessarily be private. Probably there would be little, if any, struggling to be witnessed.

As to the certainty of the extinction of life, there can be no question, for reasons known to every tyro in physiology.

Between the sickly sentimentality which would spare merciless murderers, and the brutal ferocity which would exult over their dying agonies, there seems to be a just and wise medium, where the law can take its stand, vindicating itself, protecting society, and yet inflicting no needless torture on the unhappy criminal.

The subject is one which well merits earnest thought, and my only excuse for presuming to deal with it is the duty which lies on every man to contribute his mite to the subduing of the evil that is in the world.

Editor's Table.

Vital Statistics: The Mortuary Experience of the Mutual Life Insurance Company of New York constitutes one of the most valuable contributions to vital statistics hitherto published in the United States.*

Nearly two years ago we published a review of Part I.—a preliminary report—containing an analysis from the records of the company from the beginning, covering a period of over thirty years, and comprehending the particulars of five thousand three hundred and eighty-five deaths out of upwards of one hundred thousand selected lives. The volume now before us, Part II., gives not only the various causes of death, but classifies the causes, and makes each cause a separate special study, comparing the ratio of mortality of insured—selected—lives, with equal numbers of uninsured lives of the same ages.

Consumption is considered of first importance, as being the most fatal of diseases and giving the largest ratio of mortality. To it is devoted nearly half of the volume. Of the total mortality from all causes, the preliminary report assigned to consumption 17.61 per cent. A more critical examination in the present report shows that estimate to have been too low—the true ratio being 19.74 per cent.

As a general estimate it is assumed that from ten to fifteen per cent. of all deaths are from consumption, and that it annually kills about 35 out of every 10,000 adults in nearly all communities.

As a standard of comparison the authors accept the mortality reports of New York city as being among the most complete and accurate, for the time, accessible to them; but, of course, limiting the estimates to adults: there being no experience of consequence in life insurance in the mortality of persons under twenty years of age. For this reason, perhaps, the authors accept the common fallacy that "among young children consumption is rarely a cause of death." This doctrine we believe to be erroneous; and, inferentially at least, the mortuary experience of the Mutual Life Insurance Company shows it to be so; that the liability to consumption is in proportion to the youthfulness of the subjects among the insured not only, but

* Mortuary Experience of the Mutual Life Insurance Company of New York. With Tabulated Reports and an Analysis of the Causes of Death. By G. S. Winston, M.D.; W. R. Gillette, M.D.; and E. J. Marsh, M.D. Volume II., 8vo, pp. 225. New York: Printed by order of the Board of Trustees.

at a still more youthful age, and common among young children.* Notwithstanding, according to the statistics of the United States census of 1870, collated by the authors of the work before us, the proportion of deaths from consumption to the living population is shown to *increase* steadily with each decennial period of life from 23 per 10,000 at 20 to 30 years of age, to 27 at 30 to 50, to 31 at 50 to 60, to 46 at 60 to 70, to 71 at 70 to 80, and to 111 at 80 to 90. A similar result is shown by the mortuary records of New York city, excepting from 40 to 50, at which decennial there is a small decrease. In both, the mortality from consumption is nearly constant between the ages of 20 and 60, after which it greatly increases.

In the Mutual Life Insurance Company the annual ratio per 10,000 insured lives at each quinquennial period from 20 years and upwards is: 21 to 25, 23; 26–30, 23; 31–35, 22; 36–40, 17; 41–45, 17; 46–50, 16; 51–55, 15; 56–60, 16; 61 and upwards, 18; all ages, 18.6. English experience shows per 10,000: 15 to 25 years of age, 33; 25–35, 41; 35–45, 40; 45–55, 39; 55–65, 37; 65–75, 27; 75–85, 11. German experience: 21 to 25, 19; 26–30, 39; 31–35, 42; 36–40, 37; 41–45, 30; 46–50, 38; 51–55, 35; 56–60, 32; 61 and upwards, 32; all ages, 35.7.

Age in Decennial Periods.	Annual Number of Deaths among 10,000 Living at each Age.			
	From all Causes.		From Consumption.	
	New York.	Mutual Life.	New York.	Mutual Life.
20 to 29 years, - -	170	62	70	24
30 " 39 " - -	197	72	71	20
40 " 49 " - -	231	87	66	17
50 " 59 " - -	351	139	84	14
60 " 69 " - -	589	299	110	18
70 and upwards, - -	1,430	699	150	80

Of the influence of family taint the authors observe:

"1. That, as a general rule, it is useless to investigate family histories beyond the immediate family circle.

"2. That in a majority of instances no indication of family taint can be found within this circle; in life insurance experience it was absent in 84 per cent., and in Dr. Williams' cases from private practice in 66 per cent."

* THE SANITARIAN, Vol. V., p. 337, *et sequentes.*

The results of observation are concisely summed up as follows:

—	Total Cases.	Father Consumptive.	Mother Consumptive.	Both Parents Consumptive.	Brother or Sister Consumptive.	Total tainted.	Total not tainted.
Mutual Life, - - - -	1,031	45	56	2	71	194	837
Dr. Williams, - - - -	1,000	43	67	10	224	344	656
Dr. Cotton, - - - - -	1,000	112	102	27	126	367	633

Of the influence of nativity, residence, and occupation in the United States, the Company's records are not capable of such a classification as will admit of any certain conclusions. The probabilities, however, agree with the conclusions of the United States census and the New York city reports.

The tables of the work, which are numerous, are all simple and instructive, showing that while there is considerable difference in the relative mortality from consumption at different periods of life, and under different circumstances, there is no period and apparently no condition in which life insurance may not benefit by careful selection.

"The practical conclusions are that in the selection of risks for life insurance the existence of family taint is to be allowed a due but not an excessive value in forming a judgment; that it must always be considered an unfavorable element, but affords no sufficient ground for rejecting an otherwise good risk. This refers solely to cases where *one* member of a family has died of consumption; the danger will probably be much greater where two or more have been consumptive, although our numbers are too few to establish this point. On the other hand, *the absence of such family taint does not improve the value of a life otherwise doubtful.*"

Of the inference of previous disease in relation to, or as symptomatic of consumption, the importance of hæmoptysis especially is fully verified. Of other diseases—cough, asthma, catarrh, lung disease, pleurisy and bronchitis—consumptives have had only a few more entries against them than non-consumptives. In 63 out of a total of 5,224 deaths in which hæmoptysis was recorded, 22 died of consumption; the remaining 41 of miscellaneous diseases: showing that while the general ratio of mortality from consumption was 19.74 per cent. in those against whom hæmoptysis was recorded, the ratio was 34.92 per cent., or nearly double.

In completing the record of consumption a brief synopsis of statements and conclusions is given, which show:

"1. Consumption is an extremely common disease in all parts of the world, causing from 10 to 15 per cent. of the total mortality, and destroying annually about 35 in every 10,000 adult inhabitants. In New York city nearly one-third of all the deaths occurring among adult males are caused by this disease.

2. In the experience of the Mutual Life the proportion has been 17.94 per cent. of the total mortality, and 19 per 10,000 lives annually.

3. Consumption prevails with nearly equal frequency at all ages between 20 and 60 years, and, according to American statistics, with increasing frequency above that age.

4. In life insurance experience this law of equal prevalence between 20 and 60 years does not hold good. The disease is frequent at all ages, but has a maximum at about 21 years, then diminishes up to the age of 60, and after this increases. The difference between the mortality in the general population and among assured lives is accounted for by the more ready detection of consumptive risks after middle age than in youth.

5. There is little difference in its prevalence in different sections of the United States, as experienced by the Mutual Life.

6. There are few deaths from consumption within the first year of insurance; the number increases regularly to the fourth year, after which it remains nearly uniform during all subsequent periods.

7. Our records show nothing important with regard to the influence of occupation.

8. The average weight of consumptives is considerably below that of non-consumptive persons. Hence a light weight must be regarded as a suspicious circumstance in estimating the value of a life for insurance.

9. The existence of an hereditary tendency to consumption has been generally asserted and believed, but has not been proved. Our statistics afford this needed proof. It occurs, however, only in a minority of cases, and its presence or absence should not be allowed undue weight in deciding upon the value of a life.

10. Hæmoptysis is the most valuable sign of the consumptive diathesis, and whatever its reputed cause and source may be, it should never be disregarded, and no person should be considered a safe risk for life insurance until ten years have passed since its occurrence."

Zymotic diseases are next taken up, as being, next to consumption, the most prolific cause of excessive mortality in general, and

"of special interest to life insurance companies, for the reason that many of the heaviest losses come by their means, as they attack the young in the vigor of life." The mortality of the Mutual Life from this cause, as compared with the city of New York, is only about half as great, notwithstanding the greater liability of the insured to particular epidemics or endemics not common to New York, such as yellow fever and cholera. Of these only, the ratio of mortality in the Mutual Life exceeds that of New York. The excess in the aggregate of the city over the insured is accounted for on the ground of the difference in the class of subjects.

"The city population is made up largely of the laboring and improvident classes, and covers only a small area of territory; the Mutual Life risks represent a higher social class, and also the residents of other cities and of rural districts, in which the causes of disease differ from those in New York. For instance, yellow fever is almost unknown in New York, consequently the mortality from it is very small. So, too, *the cause of malarial diseases exists in greater intensity in rural districts.* On the other hand, there was an epidemic of relapsing fever in New York for a year or two—which, however, caused no deaths in the Mutual Life. Typhus fever was also more prevalent here. Allowance must also be made for the date" (the length of time comprehended) "at which the deaths occurred. The Mutual Life experience is drawn from a period of thirty years; the New York experience from five only; and in the former we had several cholera epidemics, in the latter none." The *italics* are ours, for the purpose of calling attention to an inconsistent, and, we believe, erroneous conclusion—particularly as illustrated by New York. In this city, at least, there is other and abundant evidence of the existence of malaria, besides the fatal results—more than twice as great as the Mutual Life experience in the rural districts. Moreover, we believe the causes of malarial diseases to exist in greater intensity in cities generally than in rural districts, and that the exceptions are less numerous in the former than in the latter.

Like consumption, the mortality from zymotic diseases is highest during the first years after insurance; and doubtless also, like consumption, in being still higher during the periods of childhood and youth, previous to the age comprehended in the report under consideration.

Following the consideration of this class in the aggregate, several of the special diseases comprehended in it are briefly commented upon separately.

Alcoholism is cited as furnishing a specially wide contrast. In

the city the annual ratio of mortality from this cause per 100,000 lives is 68; in the Mutual Life only 6. It is conceded, however, that in the latter this cause is probably less fairly stated: the assigned causes of death under diseases of the liver, kidneys, etc., being not uncommonly the results of alcoholism.

Most other special diseases are also found to give larger ratios of mortality in the non-insured than in the insured. But the only other class than those above considered which seems to invite special remark is, that which comprehends the percentage of deaths from diseases of the nervous system on the mortality from all causes, and the annual mortality in 100,000 lives at each decennial period of life in New York city and the Mutual Life.

Age.	Percentage on Total Mortality.		Annual Deaths in 100,000 Lives at each Period.	
	New York City.	Mutual Life.	New York City.	Mutual Life.
20 to 29, - - - -	5.11	7.58	87	50
30 " 39, - - - -	6.84	13.17	135	83
40 " 49, - - - -	8.53	17.56	197	149
50 " 59, - - - -	11.06	20.99	389	288
60 " 69, - - - -	14.08	23.84	829	694
70 and upwards, - -	14.00	22.96	2,004	1,336

The specially observable features of this table are the ratio of increase in both classes of lives, and that the ratio of mortality almost doubles with each decade of life, and that the difference in the proportion of deaths from among the insured and the non-insured is about the same at each decade.

The same is reported to be the case in Scottish life companies.

Following this is a table taken from the Health Report of New York city, 1873, giving an abstract of the records of apoplexy and paralytic diseases from 1804 to 1873, and the conclusion is reached that the general opinion at the present time to the effect that brain diseases are on the increase is erroneous.

This example of the medical officers of the Mutual Life Insurance Company of New York, in giving the public the benefit of the experiences of that company in vital statistics, we earnestly commend to those of other companies. Life companies may in this way not only become mutual aids to one another, but powerful agencies in the promotion of human health and happiness by publishing broadcast the causes of disease.

Death-rates per 1,000 inhabitants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Pox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Type Fevs	Malarial Fevers.	Diarrhœal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500—5 weeks ending June 22..	2259	21.72	963	396		91	104	29	35	42	12	30	* 31		213
Philadelphia, 850,900—3 weeks ending June 29..	910	18.58	380	148		15	18	1	11	5	2	4	26	5	49
Brooklyn, 528,000—5 weeks ending June 22.....	955	18.8	485	135		33	36	13	26	19	3		58	8	25
St. Louis, 500,000—4 weeks ending June 29.	521	13.6	310	51		4	2	7	1	7	3	7	97	6	34
Chicago, 460,000—4 weeks ending June 29...	418	11.84	194	42		7	5	1	7	17	6	4	12	3	47
Baltimore, 350,000—4 weeks ending July 6.....	582	21.6	304	93		14	10	3	8	5	14		*		50
Boston, 363,000—4 weeks ending June 29.....	545	19.51	211	102		48	4	24	8	3	11		15	6	
Cincinnati, 280,000—2 weeks ending June 22 ...	160	13 22	82	17		9	10	1	1		1		10	2	14
San Francisco, 300,000—month of May...	377	14.77	118	66		10		3	2	4	4		12	2	29
New Orleans, 210,000—5 weeks ending June 30..	549	27.26	178	103	18	6		1	3			26	51		38
Washington, 160,000—month of May...	374	27.52	211	43		7	9	5	4	3	11	1	36	5	42
Pittsburgh, 145,000—.....															
Newark, 126,000—month of May	237	22.14	83	40			10		1	2	1	2	4		15
Providence, 108.000—month of June....	128	15.11	38	25		10	5			1	4		4		6
Milwaukee, 123,000—month of May..... ...	113	10.81	36	12		2	1		4		1			1	19
Rochester, 70.000—.....															
Richmond, 77.000—4 weeks ending July 6.....	127	15 43	65	19		1	12			1	1	4	19		10
New Haven, 60,000—month of June.....	73	14 69	25	11		6	4	1					1	3	5
Charleston, 57,000—5 weeks ending June 1.....	151	28.49	90												13
Toledo, 50,000—month of May.....	49	11.76	23	4			1		2		1				4
Mobile, 40,000—month of May	64	18.83	26	13		1							9		2
Dayton, 36,000—4 weeks ending July 4.....	39	14.12		6					1	1					
Nashville, 27,000—month of June	42	18.66	19	7						1			5		
Wheeling, 28,000—.....															
Buffalo, 170,000—....															
Knoxville, 13,000—.....															
Paterson, 40,000—.															
Petersburg, 20,000—..															
Selma, 8,000—month of May.....	19	32.24	10												1
Elmira, 20,090—month of June.....	22	13 52	10	3		4			1	1					2
Yonkers, 18,500—month of June.....	18	11.83	5	3	1			1				1	1		
Memphis, 45,000—.....															
Detroit, 115,000—..															
Syracuse, 60,000—month of June.....	50	10.64	13	6		2					1				5
Reading, 40,000—															
Sacramento, 25,000—month of May.....	29		9												1
Minneapolis, 44,000—month of May.....	57	11.44	20	7			1				1				3
Bowling Green, 6,000—.....															
St. Paul—.....															
Cleveland, 162,000—2 weeks ending June 15....	77	12.35	34	9		5	2			2	1		1	1	4

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Correspondents under this head are particularly requested to forward their communications *regularly*.

* Diarrhœal diseases in New York foot up 142; in Baltimore, 101.

Long Island City—on the authority of the *Herald*—has determined to suppress the Newtown Creek nuisance. The news is gladly received by a large portion of the inhabitants of this city and of Brooklyn, who are suffering from the terrible odors at that point. *The* "poisonous works" to which the *Herald* alludes as being disgraceful to the authorities are probably the ammonia factories. But these are far from being the only or even the chief source of the foul odors from thereabouts. We had occasion in our last number to refer to the New York depot of exportation of street dirt. The marsh of Newtown Creek is, and has been for a long time, the depot of deposit. The civic authorities of New York, being driven from Harlem Flats by the public press, are apparently disposed to retaliate on Long Island City for her long-continued sludge-acid fumes, which, though now discontinued, are scarcely missed by reason of the odors arising from the putrefaction of street filth. We have repeatedly called attention to the fact that street dirt consists of from forty to sixty per cent. of organic matter, and advised incineration as the best and most economical means of disposing of its noxious qualities: the residue would be good and safe filling.

Of the stenches which now obtain by reason of the street dirt deposited in the marshes of Newtown Creek and vicinity, we have no doubt of their persistence, in hot weather especially, for several years to come, even if the filling with it were discontinued now. Indeed, we know not how long such stenches may endure and continue to be dangerous. Covering over with a sufficient thickness of clean earth, does some good, sometimes wholly abates it, if the proportion of clean earth be large enough. But there are many examples of pent-up odors, and *cul-de-sacs* of filth kept for very long, and even indefinite periods of time, which demonstrate the futility of attempting to dispose of filth of any kind by merely covering it up or putting it upon your neighbor's premises, as practised by New York on Long Island City.—Several years ago we participated in a discussion on the nature of certain offensive matter found in *cul-de-sacs* of deep excavations made through the Harlem Marshes, in the process of laying drains. We ventured to suggest that it was excrementitious; that though distant from any known source, it had doubtless percolated through a loose stratum, or followed a crevice until pent up, and there it remained in full possession of its foul qualities; how long it might have so remained, it was impossible to conjecture. The suggestion was regarded as being overwhelmingly improbable. A few months subsequently we chanced to meet an engineer of distinction who, having heard of the said discussion, said he was glad

of an opportunity to express his concurrence in our views, and in verification of his faith in retained stenches related the following incident: "A few years ago," he said, "I was present at the excavation of the great Mastodon, near Cohoes. When we got down to where his trunk lay, about forty feet below the surface of the ground, the stench of decayed animal matter was so great that we were obliged to hold our noses, and some of the men were made sick at the stomach by it. And it was only a youngster at that; the scientists tell us that it had not been there over forty thousand years."

Brooklyn.—Dr. R. M. WYCKOFF, Registrar of Vital Statistics, has kindly sent us the following abstract of the mortality records of this city for the first half year of 1878, ending Saturday, June 29th. The total number of deaths during twenty-six weeks was 4,946, or 298 less than in the previous year. This represents an annual death-rate of 18.02 per 1,000 living, while in 1877 the rate exceeded 21 in each 1,000 inhabitants; but as the mortality in the second half of each year commonly exceeds that of the first half, the rate for 1878 will probably reach 19 per 1,000. Population is estimated at 549,000 for 1878, and at 527,000 for 1877. The death-rates in 1875 and 1876 were 25.77 and 24.36 respectively.

	First half year 1878.	First half year 1877.	Decrease in favor 1878.
Total mortality, all ages,	4,946	5,244	298
Under five years,	2,158	2,296	138
Over five years,	2,788	2,948	160
Diarrhœal diseases,	145	164	19
Diphtheria,	221	426	205
Scarlet fever,	249	439	190
Consumption,	761	796	35

No deaths by small-pox since May 30th, 1877. No cases of that disease have been known to exist in the city since July 17th, 1877, except a few cases that were directly imported from other localities. A decline will be observed in each of the factors above given; this is all the more favorable when it is taken into consideration that the population has increased while the mortality has diminished. The estimated rate of growth is .044 annually. The falling off in diphtheria (205) and scarlet fever (190) is worthy of notice. It will be observed that the decline is very nearly uniform in the case of both diseases. No explanation of the fact is here attempted, but it is significant by reason of the many features which are common

to both of them, and because they are the very diseases the prevention of which has been a prominent object of the Board. In 1876 diphtheria caused 812 deaths, scarlet fever 352.

The average number of deaths has been 192.3 in each week, or 27.5 each day. In this week, ending May 11th, there were 149 deaths, representing a death-rate of 14.11 per 1,000. This is the lowest weekly rate known in this city since the statistics of mortality began to be fully registered.

This glance at the mortality of the six months last past will not warrant any general conclusions, but it very plainly indicates that some of the prominent causes of death are less oppressive than formerly; and it will encourage the sanitary arm of the department to persist in its attack upon the preventable diseases, the so-called "filth diseases," and the diseases that destroy young lives.

The number of births reported in six months was 4,862; marriages, 1,512. It is scarcely necessary to state that both of these totals are very far from complete. The death returns are, however, full and complete.

The Gowanus Canal Nuisance, in South Brooklyn, we are glad to observe, has at last been pressed to a hearing. The Water and Drainage Committee to whom, in connection with the Committee on Public Health, had been referred the communication relative to the condition of the Gowanus Canal and the question of extending the Bond street sewer, in accordance with suggestions made by the Board of Health, presented a report setting forth that they had thoroughly investigated the nuisance, and were of the opinion that the main sewer should be continued along the edge of Gowanus Canal, taking in the Centre street sewer on its way, continuing through Lorraine street, and finally discharging into the East River at the foot of Wolcott street. They therefore offered the following:

Resolved, That the Board of City Works be directed to submit a report of the cost of extending the present outlet to his Honor the Mayor, who is under existing laws empowered to certify to the necessary amount for such work. Adopted.

Waiting for Dysentery.—"It is all humbug," said one of the Brooklyn Commissioners of City Works, recently, "for THE SANITARIAN to keep harping upon the effects of the drainage from Hempstead privies and grave-yards on our drinking water. We have had it ever since the receiving reservoir commenced, and I don't see that we have any more dysentery or typhoid fever than do the people of New York." Well, may be not. New York has the same kind of drainage from the hotel privies and cow-pastures

of Putnam county into the tributaries of the Croton, and the same large proportion of filth diseases. Grave-yard infusions, seasoned with the extract of privy vaults, may be a luxury to those who have thus become accustomed to them, just as missionary rump-steak is said to be to the cannibals of the Feejee Islands; but how the people can tolerate officials who make light of such *game* humanity as this, and await some new sign from among the dead, is beyond our powers of comprehension. The taste of the cannibal is infinitely to be preferred.

Water Filters.—The poorest people in the world, the Buddhist mendicant monks of Ceylon, religiously restrict their worldly possessions to eight things: *One* water-filter; *one* dish to hold the food they beg; *one* razor; *one* belt; *three* articles of clothing, and *one* needle with which to mend their clothes. They are said to be singularly exempt from filth diseases. The people of New York and Brooklyn should profit by the example—filter their drinking water. The best filters are the Silicated Carbon.

Bread of the best quality can only be made by the use of yeast, and the *Compressed Yeast* of Messrs. Gaff, Fleischmann & Co. is the best made, and the most convenient for use.

Dangerous Funerals.—The Health Departments of New York, Brooklyn, Boston, and of several other of our cities, have wisely adopted ordinances prohibiting the exposure of the dead bodies of persons who have died of contagious diseases—a danger more or less common at public funerals in general. Most persons of observation, at funerals, can easily recall incidents in illustration of the dangerous practice. But the special provision of the health authorities against contagious diseases is that the burial cases shall be *air-tight:* a condition which can only be met by *metallic coffins*, with closely fitting and cemented joints. These, as now made by the Metallic Burial Case Company, of New York, are provided with a cement fitted glass (with a movable metallic face-plate), by which the features can be displayed from an air-tight case, without any possible risk of either touch or emanation. The cost of such burial cases, we are informed, is about the same as ordinary well-finished wooden coffins, from $15 upwards. They are constructed in great variety and elegance of finish, and we commend them for general use.

Wisconsin State Board of Health* affords striking evidences of the progress of State medicine. The law for the establishment of this Board went into effect two years ago, in the midst

* Second Annual Report, year ending December 31st, 1877, pp. 201. Madison, Wisconsin.

of small-pox, scarlet fever, and diphtheria, all of which diseases might have been prevented and over five hundred lives saved by an earlier enactment. A large part of the labor of the Board since its organization has been devoted to the suppression of these epidemics. Of small-pox, during the month of March, 1876, there existed only *one* case in the State—in Milwaukee. Subsequent to that time, up to the end of the year 1877, it existed in 39 different localities, numbered over 1,600 cases, and killed 425 persons. During the first fifteen months, from the existence of the first case, 1,313 cases occurred in Milwaukee alone, and killed 385 persons. Of its spread in that city under the auspices of the civil authorities, and the special protection of a city attorney, who advocated the right of the people to resist vaccination and to kill one another with small-pox *ad libitum*, we have before noticed as an example of the difficulties with which health authorities have to contend in their efforts to save the lives of the people.* The report before us affords abundant evidence of the spirit and energy necessary to overcome the prejudices and efforts of ignorant office-holders. By our latest monthly reports received from Milwaukee, for April and May, there were no deaths from small-pox.

The chief labor of the State Board has been to prepare and disseminate instructive papers on the causes and the prevention of disease, and to facilitate the organization of local Boards of Health throughout the State. The special papers comprehended in the report are:

Scarlet Fever—its Nature and Means of Prevention, Small-Pox and Disinfectants, by Dr. E. L. Griffin; Hydrophobia, by Dr. Solon Marks; Water Supply of the State, by Prof. T. W. Chittenden; Report of the Ventilation of Public Buildings, and a Special Report of the Sanitary Inspection of some of the Public Institutions of the State, by Gen. James Bintliff; Value of Vital Statistics, by Prof. J. E. Davis; Village Sanitary Work, by Dr. H. P. Strong; Water and Water Supply of Wisconsin, by Dr. G. F. Witter; Abstract of Proceedings of American Public Health Association; Circulars on Scarlet Fever and Diphtheria, Small-Pox, Treatment of the Drowned, Local Boards of Health Correspondence, and Special Report of the Work of the Board, by the Secretary, Dr. J. T. Reeve. These reports and special papers are characterized by a thorough appreciation of the work to be performed, and show an amount of gratuitous labor and earnestness by the members of the Board, and the physicians in coöperation with them, which cannot fail to advance the best interest of the State in the promotion of the

* THE SANITARIAN, Vol. VI., p. 279.

health and happiness of her citizens. Already *five hundred and fifty-six local Boards of Health* have been organized in correspondence with the State Board, mapping out the causes of disease, vaccinating the children, and instructing the people how best to overcome the evil influences of pettifogging office-holders and other nuisances which have heretofore afflicted and impoverished them.

The expenses of the Board for the year, including the cost of printing and distributing documents, have been but $2,748.36, and we have no doubt whatever that the material interests of the State have been benefited more by this expenditure than by ten times its amount in any other way. The Board has in every way shown itself worthy of the public confidence it has received, and the physicians throughout the State are entitled to high praise for their active coöperation and support.

Minnesota* shows continued exemption from any general or epidemic form of disease for the year 1877, and a gratifying state of the public health throughout the State. Warned by the proximity of small-pox in a neighboring State, early and energetic measures were taken against it, among the communities most exposed, by thorough vaccination and revaccination with fresh animal virus, with its usual effect, *complete exemption.*

Besides his general executive duties, the Secretary of the Board, as non-resident Professor of Public Health at the University, gave a course of eight lectures to the senior class upon "*Some of the Problems of our Civilization in the View of Hygiene.*" In thus making hygiene an essential branch of university education, Minnesota illustrates the power of that knowledge in promotion of the best interests of the State. Knowledge of the causes of disease is akin to the first law of human nature—self-preservation—and is the right arm of sanitary authority everywhere. Closely allied to this service of the Secretary, is the inquiry into the "*Health* of the Pupils in the Public Schools"; consisting of the replies to a series of questions addressed to some of the leading teachers of the State, and also to the President of the University, with a view to such practical deductions as will best serve to classify pupils in accordance with a design to the promotion of sound bodies as well as sound minds, rather than in accordance with depraved aptitudes and indiosyncrasies which tend to promote vices of the human constitution.

"The Effects of the Immigration on the Immigrated Norwe-

* Sixth Annual Report of the State Board of Health of Minnesota, January, 1878. 8vo. pp. 122.

gians," by Ch. Groswald, member of the Board, is of peculiar interest and full of information, in a twofold degree. (1). Of the medical topography of Norway, and the habits and health of the Norwegians in their native land; and (2) of the same people in Minnesota, and particularly in regard to pulmonary consumption. Of these people there were estimated to be in Minnesota, in 1877, 60,000. The conclusions are that the ratio of consumptives has increased among the Norwegians since their residence in Minnesota, but then "it is yet too early to draw any definite conclusion in regard to the influence the climate of Minnesota has on phthisis, both because the observations cover too short a time, and because the population so far has been—and in many places yet for some time will be—exposed to other influences than will act upon their children and descendants, when the conditions of the country and of its inhabitants have come nearer to their ultimate shape." The relative prevalence of other diseases is also discussed, and the ratios for Norway and Minnesota tabulated; and the changes in regard to the habits and general health of the Norwegian immigrants. It is altogether one of the most valuable contributions to the vital statistics of immigrants as compared with native population in the United States hitherto published. The other and shorter reports and papers, are: Meteorology of Minnesota, 1875–1877, by Wm. H. Leonard, M.D.; Sanitary Water Survey of the State and Chemical Examination of Samples of Enamelled Iron Ware, with reference to their Domestic use, by S. F. Peckham, State Chemist; Letter upon the Causes and Treatment of Pauperism, with the methods and experiences of the St. Paul's Society for the Relief of the Poor, by the Rev. E. W. Chase, Relief Secretary, and the Financial Statement, complete the report, which gives evidence of excellent systematic pioneer work eminently worthy of the generous support of the State.

Reading, Pa., population estimated at 40,000. Report of Board of Health for 1877: Births (exclusive of still-born, 91), 1,266; marriages, 456; deaths (81 of which were bodies brought from a distance for interment), 964. Ratio per thousand, *as given by the report*, 22.336, or considerably more than one-third of the whole number of deaths, died of zymotic diseases. "By far the most prominent cause of death not only in this class, but in the entire mortuary table, is small-pox. . . . From January 1st, 1876 to November 22d, 1877, 944 cases were reported; 466 occurred during the year—126 deaths. Among 307 cases of varioloid there was but one death." Diphtheria killed 89—all children; consumption, 91. The Board of Health seems to have been singularly embarrassed by

the obtuseness and parsimony of the City Councils, being entirely without money throughout the year. The whole amount asked for by the department at the beginning of the year was $2,000, about the average value of one adult life—excepting always members of city councils. In the month of June this sum was reduced to $1,200 by the Common Council, and appropriated; but the amount was not sufficient to pay the indebtedness of the Board and its officers, who continued to work to the end of the year without pay. Notwithstanding, much useful work was done, and possibly the lives of the City Councilmen saved from small-pox—which they did not deserve—by the gratuitous labors of the health authorities.

Foreign Mortality.—Ratio per 1,000 inhabitants. June 2–15: London, 19.0; Glasgow, 26.6; Liverpool, 25.2; Birmingham, 21.9; Manchester, 22.7; Dublin, 25.9; Leeds, 17.1; Sheffield, 18.9; Edinburg, 22.3; Bristol, 16.2; Belfast, 28.6; Bradford, 23.1; Salford, 22.1; Newcastle, 22.7; Hull, 21.1. June 2–8: Amsterdam, 25.2; Rotterdam, 26.6; Hague, 22.1. May 8–14: Paris, 22.8. May 31–June 6: Lyons, 24.3. Month of May: Marseilles, 27.5. April 16–30: Lille, 27.7. May 31–June 6: Havre, 24.3. May 26–June 1: Berlin, 37.0. June 2–8: Hamburg, 24.5; Breslau, 28.4; Munich, 30.09; Dresden, 22.0. June 9–15: Cologne, 20.6; Leipzig, 21.3. June 2–8: Kœnigsberg, 40.2. June 9–15: Frankfort, 21.9. June 2–8: Hanover, 18.0; Bremen, 17.7. June 9–15: Dantzig, 26.7. June 2–8: Stuttgart, 21.5; Strasbourg, 26.8; Nüremberg, 25.5; Barmen, 25.2; Magdeburg, 31.7; Altona, 21.5; Elberfeld, 19.3; Düsseldorf, 26.2; Stettin, 24.6; Chemnitz, 27.8; Aix-la-Chapelle, 21.5. June 9–15: Brussels, 20.5; Anvers, 20.7; Gand, 15.3; Liege, 25.2; Geneva, Basle, Berne, Lausanne, Chaux-de-fonds, and Zürich, 22.5. June 2–8: Vienna, 29.2; Buda-Pesth, 36.8; Prague, 37.0; Trieste, 24.0; Lemberg, 25.7; Cracow, 38.1. June 5–11: Copenhagen, 22.5. June 2–8: Stockholm, 19.4; Christiana, 19.9. May 26–June 1: St. Petersburg, 51.0. June 2–8: Warsaw, 44.1; Odessa, 43.0. May 14–20: Naples, 28.3. Month of April: Milan, 32.6. May 26–June 1: Turin, 27.0. Month of April: Genoa, 29.6. June 2–8: Venice, 25.8. Month of April: Messina, 23.9; Bologna, 29. June 2-8: Barcelona, 27.6. May 19-25: Lisbon, 30.3. June 2–8: Bucharest, 27.4. May 26–June 1: Alexandria, 38.8. May 5–11: Calcutta, 42.5. May 7–13: Bombay, 44.5.

Cholera.—Number of deaths: Calcutta, 44; Bombay, 34.

Yellow Fever.—The following information is furnished by the Surgeon-General of the Marine-Hospital Service to State and

Municipal Officers of Health, etc., in accordance with the requirements of the National Quarantine Act.

Havana.—From 26 to 34 deaths from yellow fever, and none from small-pox, are now occurring weekly in the city of Havana.

Cardenas and Sagua.—Good health reported in bay and city.

Matanzas.—The captain and four of the crew of the bark "Marie Donan" were attacked with yellow fever on the 3d instant, in the harbor of Matanzas. Only one other case of fever has occurred in the shipping of that port. Sporadic cases are reported in the city, but the disease is of mild character.

Key West.—Two cases of yellow fever have occurred in the harbor of Key West. One on the Norwegian ship "Maria Frederika," and one on the Spanish bark "Dona Talaford." The city is reported healthy.

Two of the British vessels which recently conveyed native Indian troops to Malta had cholera on board during the passage from India. On one of the vessels nine cases and four deaths, and on the other two deaths occurred before the vessels passed the Suez Canal. The vessels were allowed to pass the canal without detention, though it is customary to send a vessel, on which a single case of cholera has occurred during the passage, back to Thor, 120 miles, there to remain two weeks or more in quarantine.

JNO. W. WOODWORTH,
Surgeon General U. S. Marine Hospital Service.

Washington, D. C., July 13, 1878.

International Sanitary Congress — Department of Hygiene.—This Congress will hold its sessions from the 1st to the 10th of August, at Paris, under the patronage of the French Government. The object of the Congress is to bring together in Paris, during the *Exposition Universelle*, all the scientists who take a special interest in the discussion of questions relating to the progress of Hygiene. The Congress will consist of resident and non-resident members.

The Committee of Organization is under the direction of Dr. Bouchardat, Honorary President, Professor of Hygiene in the Faculty of Medicine of Paris, Member of the *Conseil d' hygiene et de salubrité de la Seine*, etc.; Dr. Gubler, President, and Dr. Lionvelle, General Secretary.

Among the members of the committee we notice the names of some of the most eminent men in France: Jaccaud Yardieu, Vulpian, Brœa, and the editors of some of the ablest medical journals in the French language.

The committee desire to limit the discussion to a definite number

of questions, but they will not exclude others not named, if they have a sufficient general interest. The questions proposed are as follows:

1. The Hygiene of Infancy — *Hygiène du nouveau-né:* This includes the mortality among infants in different countries, and the measures most suitable to diminish it.

2. The Pollution of Water—*De l'altération des cours d'eau: a.* By waste from factories; *b.* By sewage.

3. The Hygiene of Alimentary Substances—*Hygiène alimentaire: a.* The best means of determining the soundness of animal food; *b.* On the use of certain coloring substances in articles of food, and the dangers that may arise to the public health therefrom.

4. Houses for the Poor—*Des logements des classes nécessiteuses.*

5. Hygiene of different Professions—*Hygiène professionelle:* The best means of diminishing the dangers arising from different occupations; the employment of mineral poisons, as mercury, lead, arsenic, etc.; and the possibility of substituting harmless articles for them in the arts.

6. The Prophylaxis of Infectious and Contagious Diseases—*Prophylaxie des maladies infectieuses et contagieuses*, which are the diseases that require isolation in general or special hospitals, and how to render this isolation practicable and effective.

Long Island Summer Resorts is the title of a convenient little hand-book issued by the Long Island Railroad Company, giving a sketch of the island, condensed summary of the chief places of resort, and railroad time tables. We regret to have to notice an inexcusable typographical error—*ten* for two—in the quotation from an address by ex-Governor JOHN A. DIX, in regard to the "waste lands," and are glad to clip the following from a recent number of the *Brooklyn Eagle* correcting it:

Dr. E. F. Peck:

DEAR SIR—The opinion I expressed some years ago in my address before the State Agricultural Society in regard to the fertility of Long Island is confirmed by my own experience. I have since then purchased forty acres of land at West Hampton, within a few hundred yards of the ocean, and built a house for my residence. I have raised one hundred bushels of corn (in the ear) and twenty bushels of wheat to the acre, and vegetables as fine as any I ever saw.

The island ought to be, and I have no doubt will be in time, the garden of the City of New York, and, as all know, its climate is unsurpassed in this latitude for healthfulness and for mildness, both in summer and winter.

There are spaces of limited extent which are exceptions to the

general character of the soil for fertility, like the Quogue Plains, between Riverhead and West Hampton, but those who have examined them carefully think they do not constitute more than *two per cent.* of the whole island. But I am telling you what you already know. Yours truly,

JOHN A. DIX.

A letter from General Dix, dated Seafield, West Hampton, June 28, 1878, says: "I am about 500 yards from the sea-shore, and my crops of wheat, oats, and corn are in very fine condition and of great promise."

Where to Spend the Summer on the line of the Erie Railroad, within a distance of 160 miles of New York, is the title of an illustrated manual, giving time-table, rates, places, and prices, together with a general sketch of the railway and the beauty of the scenery.

The Cathedral Schools, Garden City, L. I., signalized the conclusion of their first year on Tuesday evening, June 25th, by a reception, after having spent the previous week in a searching examination. A large number of the patrons and friends of the institution were present, and expressed much satisfaction with the progress made, under apparently inauspicious circumstances. Pending the erection of appropriate buildings, the schools have occupied four dwelling-houses, two of which were elaborately furnished at the outset by Mrs. Stewart. The other two were subsequently found to be necessary on account of the unexpected accession of pupils, as dormitories, and were appropriately furnished by the school. The total number of pupils for the year, in both departments, has been seventy-four, more than half of whom were boarders. Already engagements have been made for the beginning of the next term, September 13th, fully equal to the capacity of the present buildings, while many others anxiously await the promised appropriate and permanent structures. It is evident that the almost unequalled salubrity of Garden City, its accessibility to New York and Brooklyn, and from every part of Long Island, the care with which the Cathedral Schools have been organized, and their unexampled success for the time, commend them to all parents who appreciate these advantages.

Temperance and Republican Institutions, a pamphlet of thirty-five pages, an address by the Rev. Joseph Cook, of Boston, is an able presentation of the relations of the liquor-traffic to popular government. Its admonitions concerning the public perils which the drink-traffic involves are timely and of profound importance. The pamphlet should have a very wide circulation. J. N. STEARNS, Publishing Agent, 58 Reade street, New York.

The International Review for July-August has three political articles—Russia, by Karl Blind, of England; The Chinese Puzzle, by an anonymous San Franciscan, and Mr. Seward and Mr. Motley and the Austrian Mission, by Mr. John Bigelow; two economical articles—the Elements of National Wealth, by David A. Wells, and Industrial Reconstruction, by Edward Atkinson, of Boston; two papers of a theological character—Mr. Froude's second article on Science and Theology—Ancient and Modern; and the Moral Problem, by ex-President Hopkins. In letters and art the contributions are from M. Charles Gindriez, who writes of The French Exhibition Architecturally Considered; Mr. Hamerton, who has something to say in his usual letter about Photographic Art in Europe, and Dr. Osgood, who considers The Centenary of Rousseau. There is also an article by Gen. James H. Wilson, on Army Reorganization, and the editorial commentary on contemporary publications is long and comprehensive.

The Medical Register of New York, New Jersey and Connecticut, 1878-9,* under its new editor, is fully up to the excellent standard already established for this necessity to every physician's and dentist's office in the vicinity of New York. The present editor has profited by the annual trimming which the work has undergone at the hands of Dr. Purdy and his predecessors for the last fifteen years, and managed to keep the work within reasonable bounds, while adding everything really essential. The New York City list now contains 1,308 names; Brooklyn, 394; New York State, 2,387; New Jersey, 586; Connecticut, 405; making a total registration of physicians, 5,080; nearly 1,000 pharmacists; 110 dentists, with catalogues of all the colleges and societies in good standing; a catalogue of recommended nurses, abstract of State laws, etc., governing the profession; lists of libraries, publications, hospitals, asylums, etc., etc., of special professional and much general interest.

Parkes' Practical Hygiene has so long and so justly been regarded as the most complete work of its kind that, on the issue of a new edition,† it hardly seems necessary to say more of it than

*Published under the supervision of the New York Medico-Historical Society. William T. White, M.D., Editor. Vol. XVI. New York: G. P. Putnam's Sons.

† A Manual of Practical Hygiene. By Edmund A Parkes, M.D., F.R.S.; late Professor of Military Hygiene in the Army Medical School; Member of the General Council of Medical Education; Fellow of the Senate of the University of London; Emeritus Professor of Clinical Medicine in University College, London. Edited by F. S. B. François de Chaumont, M.D., Fellow of the Royal College of Surgeons of Edinburgh; Professor of Military Hygiene in the Army Medical School. Fifth Edition. 8vo. Illustrated, pp. 733. Philadelphia: Lindsay & Blakeston. 1878.

that it continues to lead all other works, in both arrangement and practical detail, for students, teachers, and administrators of systematic hygiene. No matter what or how many other works one may possess on sanitary science, *Parkes' Practical Hygiene* is the *sine qua non* of all well-appointed libraries. As a hand-book for ready reference, keen appreciation, and concise statements on and of all subjects pertaining to practical hygiene, it continues unequalled. For in this *fifth* edition Prof. Chaumont has shown himself to be imbued with both the letter and the spirit of his predecessor. While being equally careful with the late Prof. Parkes not to inordinately increase the size of the volume by the introduction of sanitary laws and regulations common to public documents—as too many authors of books on sanitary subjects have done—the author has been no less careful to stamp the five years' progress since the last preceding edition by needful alterations and annotations, and the addition of some new matter from notes left by Dr. Parkes. The general arrangement of the work, however, has been maintained, while the chapter on Water Analysis, and some other progressive portions, have been rewritten or altered in conformity with the most recent advances. Tables of useful numbers—metrical, thermometrical, barometrical—and standard solutions for volumetric analysis are given in the appendix; and the index has been considerably expanded.

House Drainage and Water Service is the appropriate title of the best summary of the mechanics of hygiene hitherto published in the United States.* Mr. Bayles, the author of the work, is favorably known as editor of *The Metal Worker*, a paper justly noted for its eminently practical and useful character to the trade which it represents, and which has afforded the editor thereof excellent opportunities for thorough familiarity with the subjects which he has embodied in this treatise. He is also one of the most active members, and has for several years been one of the chief contributors to the Proceedings of the New York Public Health Association, which has brought him into free intercourse with persons engaged in the practical application of hygiene. These opportunities and facilities seem to have suggested the scope of the work before us. The author has taken up the subject of domestic hygiene at the foundation of the dwelling, and discusses

* House Drainage and Water Service in Cities, Villages, and Rural Neighborhoods. With Incidental Consideration of Causes affecting the Healthfulness of Dwellings. By James Bayles, Editor of *The Iron Age and Metal Worker*. 8vo. pp. 360. Numerous Illustrations. New York: David Williams, 83 Reade Street.

so much of the questions of drainage and water service as is under the control of house-owners and plumbers. The book is not, however, in any sense a workshop manual for plumbers, but an exposition of the principles and practice to be kept constantly in view for the attainment of healthful surroundings by architects, builders, plumbers, housekeepers, physicians, sanitary inspectors, and, in short, all who are interested in the practical application of the mechanics of hygiene.

The work is worthily gotten up, on good paper, good illustrations, and well bound; and we take much pleasure in commending it.

Hereditary Influence of Alcohol. — The National Temperance Society have published the able and valuable address of Dr. Willard Parker, delivered at the recent conference held under the auspices of the Society, in Association Hall, as an eight-page tract. It will be sent to any address at the rate of $2 per 100, tinted paper; $8 per 1,000, thin paper. Also,

Books and Pamphlets Received. — Report of Board of Health, City of Richmond, Va., 1877; Asthenopia, Preliminary Analysis of 1,060 Cases, by C. R. Agnew, M.D.; Lyons' Medical Plants Indigenous in Michigan; Kershaw's Diseases of the Brain and Nervous System—Part 1; Temperance and Republican Institutions, Rev. Joseph Cook; Observations in Practical Surgery and Gynecology, Geo. B. Walker, M.D.; Report of New York Ophthalmic and Aural Institute; Responsibility in Parentage, Rev. S. H. Platt, A.M.; Report of Utica Insane Asylum, 1877; Influence of Modern Education upon the Eyesight of Children, A. N. Calhoun, M.D.; Half-time System in Education, D. F. Lincoln, M.D.; Legal Relations of Insane Patients, Foster Pratt, M.D.; Report of Health Department of Toledo, 1877; Use of Electricity in the Treatment of Epilepsy, A. D. Rockwell, M.D.; Laparo-Elytrotomy—a Substitute for the Cæsarian Section, T. Gailard Thomas, M.D.; Intra-Venous Injection of Milk as a Substitute for the Transfusion of Blood, T. Gailard Thomas, M.D.; Physics of Infectious Diseases, C. A. Logan, M.D.; Ninth Annual Report of State Board of Health of Massachusetts; Report of Board of Health of the State of New Jersey; Gynecological Transactions, Vol. II.; Visions: A Study of False Sight, E. H. Clarke, M.D.; Amputations and Excisions of the Cervix Uteri, J. Byrne, M.D.; Kings County Medical Society Proceedings, 1877; Higiene Publica, Apuntes sobre la Estadistica Mortuaria de la ciudad de Buenos Aires, desde el año, 1869 hasta 1877, inclusive; Seguidos del Movimiento de las hospitales y haspicios en 1877, y de un estudio sabre el clima por Emilio R. Coni, Buenos Aires; propenta de Pablo E. Coni, 1878.

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EDUCATION IN THE UNITED STATES.*

The Annual Report of GENERAL JOHN EATON, Commissioner of Education, for 1876, is one of the most important documents issued by the General Government; but it is the misfortune of the public that, owing to the magnitude of the work, it cannot be thoroughly distributed. The duty of placing the information which it contains, therefore, devolves upon the public press—and upon that portion of the press especially which is devoted to educational interests. Surely there is no teacher or school trustee—no reader of any school journal or other person interested in the cause of education—who may not be edified and have his interest increased by an acquaintance with the contents of this volume. The report opens with a general sketch of education for the year, shows the effects of the financial depression on the schools throughout the country—the fact that in many instances retrenchment has been sought first in the reduction of teachers' wages, the effect of the American system of education in harmonizing the opposing forces of capital and labor, the importance of universal education as the greatest safeguard of the Republic, and the general distribution of responsibility in the matter of education. Next follows a consideration of national aid—the policy which the Government adopted at an early period in its history, and which it has continued to pursue—of extending aid to education by grants from time to time in both land and money.

The lands granted and patented to fourteen States from the date of the first grant—before the adoption of the Federal Constitution—to June 30, 1876, amount to 47,802,271.16 acres. In the year 1836 alone the sum of $28,161,644.91, arising from surplus revenue, was divided (subject to call by the General Government) among twenty-six States, several of which have devoted a part or the whole of the income from this fund to public education.

The General Government has also expended considerable sums in aid of colored schools, Indian schools, and for libraries, publications, and the promotion of science.

Following is a statement of the cost of maintaining the Military

*Report of the Commissioner of Education for the year 1876. 8vo, pp. ccxiii—942. Washington: Government print. 1878.

Academy at West Point up to June, 30, 1871, and the Naval Academy at Annapolis up to June 30, 1876. The amounts cover all the expenditures from the date of organization: U. S. Military Academy, West Point, $6,801,482.73; U. S. Naval Academy, Annapolis, $3,518,880.63.

The total grants of the General Government to schools of all kinds amount to 95,737,714 acres of land, and $47,785,197.93.

The school population in the States and Territories for 1876 was 14,306,158, against 14,007,522 for 1875. The total enrollment for 1876 was 8,825,185, against 8,756,659 for 1875. Ten States and five Territories do not report the item of average daily attendance. The others give a total of 4,248,848.

The diversity of the legal school age in the several States and Territories, the Commissioner remarks, should not be forgotten in any study of school statistics. In one State it is 4–16; in three, 4–20; in four, 4–21; in two, 5–15; in one, 5–17; in two, 5–18; in four, 5–20; in ten, 5–21; in two, 6–16; in one instance (the District of Columbia) 6–17; in four States, 6–18; in three, 6–20; in ten, 6–21; in New Mexico, 7–18; among the Cherokees, 7–21; among the Creeks, 10–18. In eight instances the age of admission is 4; in nineteen instances it is 5; in twenty it is 6; in two it is 7; in one, 10; or five different ages. The school period terminates at six different ages. These differences may be justified by local considerations, but it is necessary that, for purposes of comparison, there should be given, in addition, some uniform age with which to begin and end the comparison.

The total number of teachers employed in public schools in the States and Territories of the Union (Georgia and Idaho only not reporting) was 249,283. Most of the States and Territories furnish full and accurate statistics; but Arkansas, while giving the total number of teachers, does not tell how many are male and how many female, nor their pay. Florida gives the number of teachers, male and female, but can give the pay of neither. The same is true of Kentucky, New York, and the Territories of Dakota, New Mexico, and Wyoming. Texas estimates the number of teachers and gives the pay.

A statement of the monthly compensation of teachers in public schools is presented with the remark, that "any one who should examine the column of the average salaries paid would not, from the nature of the case, expect the compensation of teachers to be the first point of attack in the efforts to retrench public expenses." The District of Columbia pays the highest average salary to male teachers, $120 per month. Arizona pays the highest salary to female teachers, $90 per month. In the District of Columbia, Nevada and Arizona, the average pay of male teachers is over $100 per month. In California it is $85; in Massachusetts, $84.78; in Rhode Island, $81.40; in Montana, $75; in Connecticut, New Jersey, Indiana, Colorado and Ohio it ranges from $60 to $67; in Utah it is $54; in Texas, $53; in Michigan, Illinois, Iowa, Oregon, Wisconsin, New Hampshire and Maryland it ranges from $41 to $48; in Mississippi, Pennsylvania, Vermont, Nebraska, Maine, Virginia, West Virginia, Minnesota, Kansas, Tennessee, Louisiana,

Delaware, South Carolina, Missouri and North Carolina, from $30 to $40; and in Alabama it is $22. Next to Arizona Nevada pays its female teachers the highest average monthly salary, $85; the District of Columbia stands next, $80; California, $68.51; Montana, $50; Rhode Island, Indiana, Colorado and Maryland, $41.40 to $48; Connecticut, Massachusetts, New Jersey, Ohio, Illinois, Oregon, Pennsylvania, Nebraska, Virginia, West Virginia, Tennessee, and Louisiana, $30 to $37; Utah, Michigan, Iowa, Wisconsin, New Hampshire, Vermont, Minnesota, Kansas, South Carolina, North Carolina, and Alabama, $22 to $29; and Maine, $17.04.

The expenditures per capita of average attendance ranges from $3.77 (in Georgia) to $62.76 (Cherokees Indian Territory).

Maine, New Hampshire, South Carolina, Florida, Alabama, Mississippi, Louisiana, Kentucky, and Colorado show a *decline* in school population and enrolment. All the other States and Territories show more or less increase—but several of them much embarrassment—for the want of more systematic management and better supervision.

"The retrogressive tendencies in educational affairs lately noticeable in some of the States in which slavery has been more recently abolished are," the Commissioner remarks, "calculated to produce great fear in many minds respecting the perpetuity of our institutions. But after a careful review of these facts and an attentive consideration of them in their several relations, and with full recognition also of the same backward tendency in certain other localities, I am increasingly convinced that their local public sentiment will not tolerate any further retrogression in these States; and that the friends of education may, on the whole, anticipate for their efforts increasing public favor."

And of the Peabody Fund: "Nothing in the history of our century just closing, indeed nothing in human history, parallels George Peabody's aid to education in the Southern States, whether we consider the amounts bestowed, or the methods in which the great trust is administered. Its operations commenced early after a great civil war. They aimed to secure not merely individual education, but the establishment of State educational systems by local action among a people who had little experience of common schools and little knowledge of their administration or their benefits."

The reports of Dr. Barnas Sears, agent of the board of trustees of the fund, show that from 1868 to 1876, inclusive, various States have been aided as follows: Virginia, $183,000; North Carolina, $82,700; South Carolina, $23,350; Georgia, $67,062; Florida, $41,950; Alabama, $51,750; Mississippi, $52,588; Texas, $7,800; Arkansas, $54,300; Louisiana, $53,850; Tennessee, $175,800; West Virginia. $100,900; making a total of $805,050.

"Great as these sums are, it can hardly be doubted that the methods by which the sums have been bestowed have increased their beneficial results tenfold."

Of city statistics a summary is presented of 192 cities, with an estimated population of 9,128,955. The number of children of school age is given as 2,205,007, though as some of the cities failed to report this item, that is much smaller than the real number. The

enrolment in public schools, all the cities reporting, was 1,343,487. The amount expended for public schools in these cities during the year (5 not reporting) was $25,016,526, while the total receipts (8 not reporting) for the year were $24,503,025. Striking comparisons are furnished by the columns showing the legal school age, the number of days schools were taught, the tax for school purposes on assessed valuation, and the average expenses per capita of the daily average attendance in public schools for instruction and supervision and for incidental expenses.

The Commissioner remarks: "The embarrassments in the study of these statistics arising from lack of school census, diversity of school age, and other peculiarities of methods noted in connection with State systems, obtain here. But in spite of all these it is manifest that efficient administration of instruction in municipalities is rapidly increasing." He considers that a point has been reached "where various questions are arising which suggest a careful revision of the whole field of public school education in our great centres of population," especially in the matters of supervision and the connection of the administration of public education with the general municipal administration of the city. An outline is presented of the different plans of supervision in the cities of Boston, New York, Brooklyn, Philadelphia, Cincinnati, St. Louis, Chicago, and Cleveland.

Normal schools number 151, having 1,065 instructors and 33,921 students. Of these 74 are supported by State appropriations, 4 by counties, 13 by cities, and 60 by other agencies. The number of graduates from these schools during the year was 2,682, of whom 1,757 have engaged in teaching.

The proper work and position of normal schools is discussed, and a syllabus of a course of study in a normal school, prepared by the former principal of the Cincinnati Normal School, is presented as deserving special attention.

Commercial and business colleges number 137, having 599 instructors and 25,234 students, showing an increase over 1875 of 6 institutions, but a decrease in the number of students of 875. New York claims the largest number of these schools, 23; Illinois, 16; Ohio, 12; Pennsylvania, 10; and the remainder are distributed among 22 States and the District of Columbia.

Kindergarten schools have increased from 35 (in 1875) to 130, having 364 instructors and 4,090 pupils. This increase is regarded as "full of encouragement. During the year the feasibility of establishing the Kindergarten in small country towns, and of connecting it with city systems, has found additional illustration."

Secondary instruction shows an increase over last year of 86 schools, but a decrease of 82 in the number of instructors, and of 1,588 in the number of students. Of the whole number of schools 219, with 15,025 students, are for boys; 312, with 21,645 students, for girls; and 698, with 69,977 students, for both sexes.

The difficulties encountered in the collection of statistics of this grade of instruction is dwelt upon, and attention called to the weakness of our educational system at the point of secondary instruction, comparing it with the German system, where there is great strength

and superiority. "It is not merely that they have in the different German States universal education so effectually carried out, but that they carry so many of the pupils up into the higher courses of instruction. Education is not only universal, but it is carried further with a greater number; hence the greater effectiveness of their educational systems."

Preparatory schools reported, 105, with 736 instructors and 12,369 students—3 more schools than reported in 1875—but the number of instructors 10 less, and of students 585 less. The number of students preparing for a classical course in college was 4,417; for a scientific course, 1,211.

Superior instruction of women is furnished in 225 schools, 3 more than in 1875. The number of instructors is 2,404, 1 less than in 1875; and the number of students is 23,856, an increase of 61.

Of the whole number of students, 5,373 were in preparatory departments, 9,671 in the regular collegiate course, 972 in special or partial courses, and 192 in the post-graduate course.

Of the 225 institutions of this class, 143 are authorized to confer collegiate degrees. The number of degrees conferred during the year was 690. As having an important bearing upon the value of diplomas given and the elevation of the standard of superior instruction for women, attention is called to the Harvard examinations for women.

Of universities and colleges the Bureau has received reports from 356 (1 more than last last year), having 3,920 instructors and 56,481 students, a decrease of 79 instructors and of 2,413 students. The number of students in preparatory classes was 28,128, of whom 7,147 were preparing for a classical and 5,707 for a scientific course; the number in regular college course, 25,647, of whom 14,859 were in the classical course, 4,903 in the scientific course, and 597 in post-graduate studies. The number of females in preparatory classes was 6,688; in collegiate classes, 3,010, nearly equally divided between the classical and scientific course.

Of these 356 colleges, 303 report libraries with an aggregate of 1,879,103 volumes, an increase of 47,613 volumes during the year, and 425,458 volumes in society libraries. The value of grounds, buildings, and apparatus as reported is $40,956,724; the amount of productive funds, $33,911,675; the income from these funds, $2,060,182; the receipts from tuition fees for the year, $1,984,811; the receipts from State appropriations (as reported), $514,034; and the aggregate amount of scholarship funds, $2,476,674.

In connection with the subject of college education, and what it accomplishes, some very interesting statistics are furnished concerning the alumni of four institutions—Harvard, Yale, and Dartmouth Colleges, and Wesleyan University.

In connection with these statistics there is also presented a summary of students in classical and scientific preparatory courses. The number reported preparing for a classical college course being: In academies, 5,995; in preparatory schools, 4,417; in universities and colleges, 7,147. Preparing for a scientific course: In academies, 2,646; in preparatory schools, 1,211; in universities and colleges, 5,707; in preparatory departments of scientific schools, 953. Total number preparing for college courses, 28,076.

Schools of science—Number of institutions and departments of this class, as reported to the Bureau, is 75; number of instructors, 793; of students, 7,614—an increase of 1 school, 35 instructors, and 457 students over the preceding year. The number of students in prepartory courses, 953; in regular courses, 6,024; in partial courses, 507; in post-graduate courses, 130.

The Commissioner remarks concerning this statement: "The summaries of facts presented in these annual reports show remarkable progress. . . . . A careful study of the figures will undoubtedly lead to the conclusion that superior education has, by taking up this department of instruction more closely related to the sciences, arts and industries, regained the hold that it was losing on the public mind, while in several instances these new institutions or departments have so dealt with great questions of science and industry in their several localities, that the farmer, mechanic, miner, and engineer are beginning to understand how this instruction is related to their several industries, and to cherish and endow it, and send their sons to the institutions where it is imparted."

Scientific associations, academies of science, etc., reported, 63. Of these 54 report a membership of 20,851; 35 report a yearly income of over $84,437; 51 report libraries aggregating 206,444 volumes, and 32 report publication during the last five years of 47,575 pages (mostly octavo). The table also shows the number of meetings held by the several associations, &c., each year, the average attendance at the meetings, and titles of publications.

Theological institutions (including theological departments), 124, with 580 instructors and 4,268 students; an increase of 1 school over 1875, but a decrease of 35 in the number of instructors, and of 966 in the number of students.

These theological schools and departments are distributed among the denominations as follows: Roman Catholic, 18; Protestant Episcopal, 17; Presbyterian, 16; Baptist, 15; Lutheran, 14; Congregational, 8; Methodist Episcopal, 7; Christian, Reformed, and United Presbyterian, 3 each; Cumberland Presbyterian, Free Will Baptists, Methodist Episcopal (South), Unsectarian, Reformed (Dutch), and Universalists, 2 each; African Methodist Episcopal, Mennonite, Methodist, Moravian, New Jerusalem, Union Evangelical, Unitarian, and United Brethren, 1 each—total, 124.

The number of volumes in the libraries of these institutions (all but 4 reporting) is 646,176; the value of grounds and buildings (all but 13 reporting) is $6,584,515; the amount of productive funds (all but 13 reporting), $7,962,374; the income from these funds, $529,204.

Schools of Law, 42, with 218 instructors and 2,664 students, a decrease of 1 school, 6 instructors, and 13 students since 1875. The number of these students who have received a degree in letters or science is 675; the number of graduates at the commencement of 1876 was 742.

Schools of Medicine, Dentistry, and Pharmacy, 102; the number of instructors in these, 1,201; the number of students, 10,143; the number of schools is 4 less than in 1875, but there is an increase of 29 in the number of instructors and of 172 in the number of students. The schools are classed as follows: 63 "regular," with 826

instructors and 7,498 students; 4 eclectic, with 36 instructors and 314 students; 11 homœopathic, with 133 instructors and 877 students; 11 dental, with 152 instructors and 520 students; 13 pharmaceutical, with 54 instructors and 934 students. The value of grounds, buildings, and apparatus belonging to these institutions is reported as $3,489,800.

The Commissioner comments upon the increasing favor with which efforts for the elevation of the standard of medical education are received, and the fact that those institutions which have adopted high standards and will certify only to thorough work have not lost patronage, as so many predicted they would.

The number of degrees of all classes conferred in course was 9,179; honorary, 411. These were distributed as follows: In letters, 3,593 in course, 153 honorary; in science, 1,099 in course, 8 honorary; in philosophy, 150 in course, 27 honorary; in art, 8 in course; in theology, 125 in course, 137 honorary; in medicine, 3,177 in course, 21 honorary; in law, 953 in course, 63 honorary. Of the whole number of degrees, classical and scientific colleges conferred 5,946 in course and 386 honorary; colleges for women, 690 in course and none honorary; professional schools, 2,543 in course and 25 honorary.

The Commissioner, alluding to the subject of the sale of diplomas, says: "This has been a subject of more or less correspondence since my connection with the office. The sale of diplomas in foreign countries has become a great disgrace to institutions of learning in the United States. There should be some way to put an effectual stop to the occasion of the scandal." Extracts are given from foreign correspondence and foreign journals on this subject.

Public Libraries are summarized as follows: Total number of volumes (3,723 libraries reporting), 12,376,473; total yearly additions (1,556 libraries reporting), 441,722; total yearly use of books (784 libraries reporting), 9,065,178; total amount of permanent fund (1,732 libraries reporting), $6,523,747; total amount of yearly income (879 libraries reporting), $1,329,703; total yearly expenditures for books, periodicals, and binding (814 libraries reporting), $572,477; total yearly expenditures for salaries and incidental expenses (679 libraries reporting), $691,324.

The report furnishes historical sketches (not received in time for insertion in their proper place in the Special Report on Public Libraries) of several libraries formed during the colonial period.

The libraries for the crews of life-saving stations, chiefly donated by Mrs. Burtis, of Philadelphia, are briefly described. Notices are given of the Library of the Interior Department, of the Library of Congress, and of the Boston Public Library. The Conference of Librarians, which met at Philadelphia in October, is noticed at length. Its importance in making known the advantages of the free library system in this country and in lessening the amount and improving the character of the catalogue and other work of librarians is referred to, and a list of the papers read at the conference appears, together with an account of the formation of the American Library Association.

The relation of art to education is noticed, and special attention invited to the beneficial results of the study of drawing in States where this has for several years been a part of the regular school course of study.

The record of "memorable events" of the year is as follows: The opening by the Pennsylvania Academy of Fine Arts of a new and commodious building, and the reopening of the art schools, which had been closed for several years while the new building was in progress. The Boston Museum was also inaugurated and took possession of its new building in the summer, the art school under its supervision being opened for the first time in the autumn of this year. Two wonderful art loan collections were made in New York during the summer, bringing together a most remarkable assemblage of the best work of modern art. This year saw also the inception of an institution which promises to be of the greatest importance to industrial art, viz., the Pennsylvania Museum and School of Industrial Art, in Philadelphia, which has secured the retention in this country of many of the choicest examples of artistic productions contributed by the artists and artisans of all countries to the Centennial Exhibition. A similar museum of industrial art was incorporated at New Haven, which is likewise largely enriched from the treasures of the Centennial.

Among events bearing more directly on education in art may be mentioned the reopening of the art schools of the Pennsylvania Academy of Fine Arts; the founding of the schools of the Pennsylvania Museum, which have in view the direct application of art to industry in all its forms; the founding of the High Art Schools of the Boston Museum of Fine Arts; the founding of a normal art instruction department in connection with the Woman's Art School of Cooper Union, New York, for the training of teachers to teach drawing in the public schools of that State; the founding of art galleries in connection with the South Hadley Female Seminary, in Massachusetts; with the Smith College for Women, in Northampton, Massachusetts; and the additions made to the excellent art collections possessed by Vassar College, with a view to the opening of a department for the serious teaching of art in all its branches.

A table in the appendix to the report presents statistics concerning art museums and institutions affording instruction in art, so far as these have furnished information in reply to inquiries addressed to them by the Commissioner of Education.

Schools for the deaf and dumb.—In 42 institutions of this class, with 312 instructors, there have been during the year 5,209 persons under instruction. The whole number who have received instruction in these schools since their organization is 16,686. Of these 247 have become teachers. Of the present number of instructors, 312, 42 are semi-mutes. The value of grounds, buildings and apparatus belonging to these schools, as reported, is $6,191,771. They have received from State appropriations during the year $1,298,516, and from tuition fees $66,498. The expenditures for the year were $1,232,858.

The Commissioner remarks that "the progress of deaf-mute education is greatly promoted by the National College for Deaf-

Mutes. This is situated at the seat of National Government, is sustained by grants from the National Treasury, and offers advantages to sufficiently advanced students in the several congressional districts through the country. The State institutions, necessarily chiefly devoted to elementary and secondary instruction can, by a proper arrangement of their course of study, readily fit for this advanced training any one who may desire."

Schools for the blind.—Information is given of 29 of these schools, having 580 instructors and other employes, and 2,083 pupils. The number of persons who have been under instruction in these schools since their opening is 7,684. There are, in the various institutions, 171 blind employés and workmen. The value of grounds, buildings, and apparatus belonging to these institutions, as reported, is $3,680,330.

Orphan Asylumns and Miscellaneous Charities.—The statistical table includes 385 institutions, of which 188 are classed as orphan asylums, 20 as soldiers' orphans' homes, 15 as infant asylums, 36 as industrial schools, and 126 as miscellaneous charities. The whole number of inmates, as reported, is 47,439, under the supervision of 3,197 officers and teachers. The number of inmates since the foundation of the various institutions is 409,996. The income for the year, as reported, was $3,489,618; the expenditures, $3,841,452.

Reform Schools.—Nineteen States and the District of Columbia report 51 schools of this character. The number committed to them during the year was 9,514; number discharged during the year, 7,698. The whole number committed since establishment is 109,394. The number of inmates at the time of reporting was 12,087. The cost of these institutions for the year (3 not reporting this item) was $1,404,183. Their earnings (8 not reporting) amounted to $174,119. All the institutions but one report libraries, aggregating 36,925 volumes.

Schools for the Feeble-minded.—Eight States report 11 institutions for this class of unfortunates, with 1,560 inmates, under the care of 318 instructors and other employés. The number dismissed improved since opening (4 institutions not reporting), is 1,820. Massachusetts has three of these schools, New York 2; Connecticut, Illinois, Iowa, Kentucky, Ohio and Pennsylvania, 1 each. Seven schools report a total income of $276,388, and 9 a total expenditure of $302,686.

Educational Benefactions in 1876.—The whole amount of benefactions for educational purposes of which the Bureau has received information is $4,691,845. "It is very gratifying that in the severity of the financial trials of the country the total amount is in excess of that for 1875." The benfactions were bestowed as follows: Universities and colleges, $2,743,248; schools of science, $48,634; schools of theology, $254,524; school of law, $2,500; schools of medicine, $36,750; institutions for the superior instruction for women, $79,950; preparatory schools, $202,331; institutions for secondary instruction, $318,132; libraries, $970,300; museums of natural history, $1,725; institutions for the deaf and dumb, $33,751.

Education at the Centennial is briefly reviewed. Correspondence, publications, and visiting agents were used to stimulate and

interest educators at home and abroad, and pains were taken to bring to the knowledge of the Director-General and his associates the plans and wishes of the educators of the country. Great difficulties were encountered, especially in obtaining the amount of space desired, and this not being granted, there resulted an absence of any organized educational exhibit.

After the opening of the exhibition much was done by the Office to facilitate the investigations of foreigners who desired comprehensive views of education in this country, and also to facilitate intercommunication between American and foreign educators. Many local memorial centennial reports of educational systems and institutions have already been published; others are in course of publication.

The Commissioner presents also a résumé of the special exhibit of the Board of Education, and refers to the Centennial Normal Institute and to the International Educational Conference, both held in Philadelphia during the summer of 1876. He also alludes to several notable educational visitiors.

Training Schools for Nurses.—Since the opening of the Bellevue Hospital Training School, in New York, in 1873, schools have been opened, though not all on the same plan, in Boston, New Haven, Philadelphia, and at Charity Hospital on Blackwell's Island. The Johns Hopkins Hospital, in Baltimore, is preparing plans for one on a large scale, and others are projected in New York and elsewhere. In May, 1875, the first class of six graduated from the Bellevue Hospital School. A second class of seven graduated in January, 1876, and since that time the school has sent out, every six months, a class of trained women, who either establish themselves in the work of private nursing or remain attached to the training school as nurses. The course of training requires two years.

The remainder of the report touches upon various related subjects at home and abroad; various practical methods devised by legislation and otherwise promotive of educational progress in its different phases, all going to show comprehensive study and skilful analysis.

The work of the Office, in the shape of correspondence with educationists, has greatly augmented during the last year, and the additional institutions reporting account chiefly for this increase; but it is also in a large degree due to the fact that people interested in educational problems are beginning more and more to write directly to the Office for information which may aid them in the solution of these problems. In addition to which the report presents statistics of other nations, with a detail of the most prominent features of excellence, not only in regard to school systems in general, but respecting agricultural, technical, and commercial education, of great practical utility to all persons interested in the progress of human culture.

STREET CLEANING OF PARIS.*

1. *Personnel.*—There are two Chief Engineers, each at the head of a division; 8 Engineers, aided by 51 Assistant Engineers and 61 Sub-Assistant Engineers, in all 112 agents. The work is supervised by the General Inspector of Bridges and Roads, who is the head of the Department of Public Works of Paris, and the whole *personnel* costs, exclusive of Engineers' salaries, 260,000 francs, or about $52,000 per annum.

2. *Material and Disinfectants.*—These are kept, for the first division, in a central store, and all implements and compounds are classified and delivered against receipt to the division engineers, who are responsible for them. In the second division there is a similar store for each section. The disinfectants are chloride of lime, sulphate of zinc, sulphate of iron, and carbolic acid; muriatic acid and nitro-benzole are used for cleansing.

For decomposing the volatile compounds of organic fermentation the chloride of lime proves an excellent disinfectant, being specially efficient for fecal or putrid matter. For gutters it is used in twenty times its own weight of water.

Sulphate of iron and sulphate of zinc are both used for the same purpose, and are combined with ten times their weight of water. The sulphate of zinc is more energetic in action, costs more, but is odorless, and is much used in summer to disinfect the cellars under the fish and poultry markets. Diluted in eight volumes of water, with three per cent. of sulphate of copper added, it will keep long and is an excellent disinfectant for dwellings.

Carbolic acid is not, properly speaking, a disinfectant. It will not dispel bad odors, but prevents putrification. It is a powerful antiseptic, and its proper combination is forty volumes of water to one of phenol or carbolic acid. Foul places, such as slaughter-houses and markets, are sprinkled twice a week in summer with a solution of one volume of acid in one or two hundred volumes of water. Stagnant pools are sprinkled with water containing a thousandth part of carbolic acid. Hydro-chloric acid is used for urinals and water-closets in a solution of six volumes of water.

Nitro-benzole is energetic in action, but leaves a strong smell and a whitish crust, which must be removed by water. Its mixture is the same as hydro-chloric acid. The two latter disinfectants oxydize metals and burn clothing. Only the most careful workmen are allowed to use these acids, and they are comparatively innocuous when diluted in ten parts of water. The annual expenditure for this branch of the work is 220,000 francs, or $45,000.

3. *Sweeping of Public Ways.*—The principal enactions of the latest law concerning street-cleaning (which took effect January 1st, 1874) are:

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* A paper read before the Civil Engineers' Club of the North-west, June 18th, 1878, being a translation from the French of M. Vaissiere, Chief Engineer of Bridges and Roads, by L. Soulerin.—*Engineering News.*

First. The obligation previously incumbent on land tenants on all streets and thoroughfares to sweep half of said ways in front of their premises, is converted into taxation payable in money.

Second. But the payment of said taxes does not exempt land tenants from any obligations which may be imposed on them by police regulations in time of ice and snow. This taxation is proportioned to rates of travel and health necessities of location.

The street area cleaned in Paris under supervision of the city engineers is 3,581 acres, of which 2,000 acres are for accounts of land tenants, and 1,000 acres for city's account. But as metalled roads and their sidewalks are cleaned by a special body of men, the cleaning power proper of the streets of Paris included an area of 2,667 acres. The whole of this surface is swept once every morning, between three and six in summer, and between four and seven in winter, after which come the scavengers, who run in summer from six to eight, and in winter from seven to nine o'clock.

In addition to this the streets are swept when needful, street gutters cleaned twice daily, public seats and urinals washed, streets cleaned and disinfected, and police stations taken care of. This work is not usually complete till late evening, especially during severe frosts, when sand has to be sprinkled over streets having steep inclines.

The city employs 3,000 persons—2,200 men, who earn from fifty to eighty cents a day; 950 women, who earn from four to five cents an hour; and 30 young boys, at four cents an hour. These compose 122 gangs, each made up of one foreman and thirty workmen in the first division, and sixteen working people in the second division. Besides this small army of workers 190 sweeping machines are required for street cleaning. Since one machine does the work of ten men, they are equivalent to 1,900 men, making in all the equivalent of 4,900 people employed.

The Halles Centrales require incessant attention from the Street Cleaning Department. They are built in the centre of Paris, and consist of ten lofty cast-iron *pavillons*, set on stone basements. The *pavillons* are connected by covered alleys. Each *pavillon* is sued for retail trade. The cellars are store-rooms for implements used in handling provisions. The work done at the Halles consists in sweeping, washing, removing refuse, and disinfecting. Sixty persons are thus employed in these Halles. The morning sweeping is done, 1st, with a wooden scraper; 2d, with a birch broom; and lastly, with a machine. In washing these markets ordinary water is first used, then solutions of carbolic acid. All wetted parts are lastly cleaned and dried with an india rubber scraper. The refuse is removed several times daily. That taken from the cellars sometimes amounts to 2,471 cubic feet daily. It consists of manure, vegetable remains and offal, which are hoisted by swinging cranes into the carts. For this, small cars with movable bottoms are employed; they contain one cubic yard each, and are brought under a hole where they are seized by the crane, then hoisted, and their contents dropped into the cart by an opening in the bottom.

Sweeping Machines.—Two are used—the English machine, perfected by Sohy, of Paris, and the machine patented by M. Blot.

Sohy's is considered the best. In both the machinery is simple and reliable. Each occupies little space, consisting only of a strong frame carried on two wheels, with a driver's seat, and drawn by a single horse. On the rear is the sweeping apparatus, made of an inclined cylinder, with spirals of piasava splints. This brush is set in motion by a wheel, to which it is connected by a gearing, which the driver can connect or disconnect at will from his seat. The machine is used in all weather, and is efficient on all roads and pavements, whether metalled or asphalt. The mud and dust gathered is left in long strings, which, at the return of the machine, are thrown nearer the sidewalk, and so on, until it can be put in piles nearer the gutter, or thrown into the sewers. One machine weighs 1,650 lbs.; requires only one horse, who works at a walking pace, and sweeps 1 1-3 acres hourly. Either machine when new costs $200, and requires $40 a year for repairs, outside of renewal of brush roller, which costs $14 per brush, which is serviceable for 160 to 180 hours.

The annual total for cleaning the streets of Paris is $584,000.

4. *Removal of all kinds of Refuse. Ice and Snow.*—The refuse of the Paris streets is inferior as a fertilizer to what it formerly was, owing, firstly, to the disuse of gutters in the middle of the streets and the adoption of curved surfaces; next, to the construction of metalled roads instead of paved streets; and lastly, to the spreading of sewerage and water distribution. Every day 520 carts and drivers, and 980 horses, are required to remove this refuse. The average amount of all matter removed is 2,223 cubic yards. The expense of cartage is in inverse ratio to the richness of the refuse. Before the scavenger's cart begins its rounds, the rag-pickers secure paper, rags, bones, broken glass, etc., from the receptacles left in the street. Rag-picking gives occupation to 7,000 licensed persons and as many non-licensed ones, their earnings varying from a franc and a half to two and three francs a day. The yearly total thus made amounts to seven or eight millions of francs.

Removal of Ice and Snow.—The area from which snow must be removed is 4,220 acres, and a depth of four inches of snow represents a volume of over 1,961,000 cubic yards. This accumulation is removed partly by land tenants and partly by the city administration, who are aided by those sewers which convey hot water, and into which snow can be thrown without danger. As soon as thawing begins the hydrants are opened, sweeping machines used, and in a short time the city resumes its ordinary aspect. Snow ploughs cannot be used in Paris, as the snow is not deep enough, and is too quickly hardened by the pedestrians. The annual total for this branch of work is $181,000.

5. *Street Sprinkling.*—The city sprinkles not only the planted alleys, the squares, bridges, quays, but also those parts which are watered by land tenants. The operations last from March 15th to October 15th for metalled roads, and from April to September for paved ways. Water is thrown daily by means of water tanks, or hose and nozzle, the latter being used on the boulevards and some of the more important streets. Tanks and hose, with their frames, belong to the city; contractors supply horses and drivers, the whole being under the supervision of the city. The best tank used

[illegible] Bay. It is an oblong box, made of sheet-iron, has a [illegible]river, whence the tank can be worked. The tank con[illegible]ons, and works on a strip fifteen feet wide at each pas[illegible] t is emptied after a run of from 1,500 to 2,000 feet, accord[illegible] capacity. The filling is done by a leather or india-rubber [illegible] screwing to hydrants under the sidewalk, and so spaced that [illegible] have short distances to run when emptied. One tank [illegible] for an area of two and a half acres of metalled surface or [illegible] acres of paved streets. Hand sprinklers are used for the [illegible] alleys. The hose is screwed to hydrants placed at suitable distances, and the apparatus, which is from forty to forty-six and a [illegible] feet long, can, with a head of fifty feet, throw a jet of amplitude of forty feet. One man can with this apparatus sprinkle five acres in thirty-five minutes, time employed in moving being deducted. It is economical and convenient, and its use has been largely introduced into the interior of the city. There are 322 tanks in use, which consume a daily average of 1,600,000 gallons. The cost of each tank, including driver, is $48 per month. Hose sprinkling, all incidentals being counted, costs a trifle over one-half the expense of water tank sprinkling.

This chapter would be imperfect without an account of trials made to replace water by deliquescent salts, which trials had for their main object the doing away with the unsightly water tanks and the inconvenience resulting from an uneven spreading of water. In 1859 and 1863 Mr. Darcy, chief engineer in charge of promenades in Paris, experimented on the principal avenues of the Bois de Boulogne. He first used refined chloride of calcium, which was very expensive, as it could not be dissolved in water so as to be thrown from tanks, it had to be thrown by hand in quantities of 250 grammes for each square metre. Its efficiency was felt for five or six days. Later, in 1862, experiments were resumed with crude salt mixed with chloride of manganese. It was sprinkled by hand, 500 grammes to the square metre, but was only efficient three days, and if the air was not moist a light sprinkling of water was necessary. In 1864 General Inspector Homberg made new trials. Pure and white of magnesium was the salt used, and which could be completely dissolved in water. It was found that the operation had to be performed in the evening, by throwing it either dry and by hand, or in solution in water, so as to spread 500 grammes per square metre for the metalled roads and 400 for the pavements. For the first twenty-four hours the result is good, but the following day one sprinkling has to be done, two sprinklings are necessary the second day, and the effect has entirely disappeared on the third day. Sprinkling the dissolved salt with the tank costs more than salt thrown by hand. An area of two and one-half acres requires five tons of salt, lasting only three days, costing 100 francs, and 112 with the labor, against 36 francs, the cost of *ordinary* tank sprinkling for the same area. Hence it results that the use of deliquescent salts would be very onorous. The sprinkling with water adds freshness to the air, prevents dust and opposed dryness, while salts, taking the little moisture left in the atmosphere, would prove far less hygienic if used, and only in case of lack of water is it allowable to use deliquescents in Paris. Street sprinkling costs the City

of Paris $90,000 annually. The total expense of the services above recapitulated is $973,000 annually.

Hygiene and Consumption.—At the tables of how many farmers and mechanics, we wonder, is the buckwheat breakfast gone into disgrace? We readily recall the time when uncounted multitudes of families broke their fast of twelve hours and faced the work of a blustering winter day with nothing but greasy buckwheat cakes and molasses! They might almost as well have eaten sawdust; and what had they for dinner? Boiled salt-pork and potatoes, and for supper boiled salt-pork and potatoes again—cold, and made palatable with vinegar! Ah, we forget the pie—the everlasting pie, with its sugary centre and its leathery crust—the one titillation of the palate that made life tolerable. Good bread and butter or milk, abundant fruit, beef and mutton, nutritious puddings—all these things have been within the reach of the people of New England, for they have always been the thriftiest people in the world; but they have cost something, and they have not really been deemed necessary. The people have not realized that what they regarded as luxuries were necessaries, and that the food upon which they have depended for protection from the climate and for the repair of the wastes of labor has been altogether inadequate, and has left them with impoverished blood and tuberculous lungs.

After taking into account all the influence of heredity, which is made much of in treating of the causes of phthisis, insufficient nourishment is responsible alike, in most instances, for the deposit of tubercle and the inflammation to which it naturally gives rise. There are many men who by a change of living render the tubercles already deposited in their lungs harmless. Vitality becomes so high in its power that it dominates these evil influences, and they live out a fairly long life with enemies in their lungs that are rendered powerless by the strength of the fluid that fights them. We have seen consumption cured again and again by the simple process of building up the forces of vitality through passive exercise in the open air, and the supply of an abundance of nutritious food; and we have no doubt that it can be prevented in most instances by the same means.

No human body can long endure the draught made upon it by a cold climate and by constant labor, unless it is well fed, well clothed, and well housed. Somewhere deterioration will show itself, and in New England—nay, all over the kingdom of Great Britain it is the same, where the people are worse fed than here—the poverty of blood shows itself in the deposit of tuberculous matter in the lungs. There should be by this time some improvement in New England, in consequence of the increased intelligence of the people; but so long as so many of them are running westward, and their places are taken by an ignorant foreign population, it is not likely that the statistics will show much improvement for a great many years to come. If our physicians could only be paid for preventing disease, and could be permitted to prescribe for each family its way of living, there would be but little difficulty in routing from its stronghold that most fatal and persistent enemy of human life, which we call consumption.—*Dr. Holland in Scribner's.*

THE MEDICAL JURISPRUDENCE OF THE ROMANS.

By Max F. Eller, Esq., of the New York Bar.

Proceedings of the New York Medico-Legal Society, June 5, 1878; the Hon. George H. Yeaman, President, in the Chair.

No attempt is made in the following pages to give an exhaustive treatise of the subject, but an endeavor to present in a few broad outlines the salient features of the Roman law as affecting medico-legal matters, and with intentional omission of even alluding to many points which have no historical or antiquarian interest at the present time.

When I speak of the Roman law, I mean to be understood always as referring to the Code of Justinian, as being the highest and best exponent of Roman law. Its comprehensiveness and completeness enable the student to find sufficient evidence of the high regard paid by the Roman jurists to men of other sciences, and the great care bestowed by them upon the teachings and theories of cognate branches of learning. Although medical science was but in its infancy, comparatively speaking, yet the Roman jurists paid great attention to medical matters as affecting legal rights and duties both of the individual and of the community. The result was that the Corpus Juris Civitis is full of matters of medico-legal interest; medical jurisprudence, as a science, was of course unknown, but medico-legal principles and their application were not.

Direct reference to rules of medical science and the opinions of physicians there are very few. Hippocrates is mentioned by name several times, and then always as "Hippocrates doctissimus." The legal period of gestation, for instance, is specified as ten months, "propter auctoritatem doctissimi Hippocratis." The Roman physician Celsus, who lived during the reign of the Emperor Augustus, introduced the system of Hippocrates in Rome, and is therefore frequently called the Roman Hippocrates. His name is occasionally, though seldom, quoted as authority for some medico-legal matter. The different medical schools were, happily, unknown to the old Romans, and the rules governing expert testimony, and its influence in the courts, were not practically set at naught by the multiplicity of experts, and the equally great multiplicity of their opinions. There was one class of experts, however, of whom I shall speak hereafter, who played a very important part in legal controversies; but there were no differences of opinion among them to bewilder the jury and appal the judge.

Children, by right, claim our attention first, and among them the unborn ones have the preference of our consideration.

The Roman law considered the fœtus as a "pars viscerum matris." Hence abortion was not considered as a quasi homicide, as does our law. No punishment was meted out to the villains who

helped the unnatural parent to rid herself of the unwelcome fruit of her transgression. Cicero, in his pro Cael, distinctly lays down the doctrine, and states the legal maxim to be that abortion was not a crime. But it was considered a highly immoral act for a woman, married or unmarried, to submit to it, or to resort to it herself, and the sale of drugs for purposes of abortion was severely punished. This does not differ practically from the provisions of our laws, where the abortionist who either sells the drug or uses the instrument is severely punished (if convicted), but where the unnatural mother is allowed to go free. The only punishment which the Roman law inflicts upon the guilty mother is this, that it makes abortion a ground for divorce. This provision even appears for the first time in the Novellae of Leo, and there only as a doctrine upheld by some jurists and repudiated by others.

The explanation of the laxity and uncertainty of the laws relating to this and kindred topics, which I care not to mention here, and which have commanded the attention of the criminalists of all ages and nations, is found in the looseness of the morals, the slight regard paid to family ties, and the baneful influence of slavery and its satellites—concubinage and other worse habits—introduced by the Greeks and Oriental nations.

The provisions as to infanticide are quite rigorous. They present no features of interest. But permit me to call your attention to a very curious rule. As is well known, the laws of all nations define infanticide as the killing, *by the mother*, of her child, immediately upon or shortly after birth. So does the Roman law, with this exception, that it speaks also of an *infanticide by the father*. This crime has been committed when he takes the newly-born child and intentionally kills it by exposure or abandonment.

While in the criminal aspect the fœtus is considered only as a pars viscerum matris, yet in the civil law the rule changes, and the embryo or fœtus is considered as living: "Qui in utero est, perinde ac si in rebus humanis esset, custoditur."

This is important, especially in regard to the law "de ventre inspiciendo," of which I shall speak more fully hereafter.

The utmost limit of the period of gestation is fixed, according to Hippocrates and Celsus, at ten months of forty weeks. The child which was born ten months after the death or divorce of the father was not considered a legitimate child, nor was one which was born within less than 182 days after marriage. This was the earlier doctrine. But the Emperor Adrianus, who ruled in the beginning of the second century, and died in 138, extended the term of legitimacy from ten to eleven months.

Pliny mentions that the praetor L. Papirius declared that a child born thirteen months after the death of the father might be considered legitimate, as (these are his words, as quoted by Pliny) "there was no certain period for the completion of gestation."

This subject affords the first glimpse of the battle of the experts, although in this case a lawyer took it upon himself to play the role of an expert in matters of parturition. I modestly leave the criticism as to the wisdom of his decision to the medical side of the house.

In accordance with the rule fixing the outside limit of gestation, it was provided that a widow should not be allowed to marry again until ten months after the death of her husband, or after divorce. The Emperors Gratianus and Valentinianus (father and son), who reigned in the fourth century, extended this period to twelve months.

"Hippocrates illustrissimus" is also quoted as authority for the rule that a child born in the seventh month of gestation shall be considered legitimate. The provisions of the Roman law in regard to posthumous children are very stringent, and especially so, as the sex of the child is of the greatest importance. For purposes of inheritance, etc., it is of the utmost weight whether a child is a female or a male.

This accounts for the great care bestowed upon the chapters of the Corpus Juris Civitis, treating of the laws of wills and inheritance. Even the hermaphrodites are not forgotten. The question may be raised by heirs or other parties interested whether the child be of the male or female sex. The law decides that a hermaphrodite shall be adjudged to belong to that sex which prevails in or on him or her. How this is to be determined is not stated, and if we look to modern medicine and physiology for information it might be said that even now this is a very difficult question to solve.

The Roman law further says that a hermaphrodite in whom the male sex predominates may be permitted to become an heir.

Under the circumstances it can easily be imagined how all the hermaphrodites would prefer to have the male sex predominate, especially for the purpose of contesting a will in the surrogate's office, in Rome. What an inexhaustible mine this must have been for the probate lawyer's ready-made experts, as they ascended the steps of the forum with their short-hand writers and witnesses.

Allusion has been made heretofore to the peculiarity of the Roman law in its preference for male heirs, and in its generosity to them to the exclusion, almost, of female heirs. These conditions rendered it necessary to throw the most powerful safeguards around the birth of posthumous children, and the pretended or real pregnancy of Roman wives and mothers. The temptation to a widow, or, for that matter, to a wife, to substitute a male for a female child, or to deny or conceal her pregnancy, for fear she might be only with a female child, must indeed have been great. The deception in either case was undoubtedly extensively practised, and hence the stringent provisions, worked out into the finest details of that celebrated chapter of the Corpus Juris Civitis, entitled "De ventre inspiciendo custodiendo que partu."

That accomplished member of the bar of this city, William Henry Arnoux, Esq., several years ago read before this Society a very interesting paper on the "Writ de Ventre Suspiciendo" under the English common law. His remarks were predicated upon a motion which had been made in the celebrated Rollwagen will case in the Surrogate's Court of this city, for the issuing of that writ. You are all familiar with the facts of that case. I had the honor then of making a few remarks as to the origin of that writ under the Roman law, and I repeat them here in brief.

The inspectio ventris, etc., according to Roman law, will be decreed in the following cases:

1. Where a woman denies her pregnancy after having left her husband.

2. Where a woman is alleged to simulate pregnancy.

3. Where a woman asserts pregnancy after death of her husband.

In the first case, that is, where a woman denies her pregnancy after having left her husband, the praetor, on application of herself or other proper parties, appoints a custodian to keep her in his custody. He also appoints three matrons, generally midwives, to inspect her. After inspection, if a majority of two of these matrons pronounce her pregnant, then she must submit to the appointment of the custodian; and the rule is for her to remain at the house of the custodian either until after she has given birth to a child or until after she has practically demonstrated that her assertion that she was not pregnant was true.

The jurist adds, with much dry and quaint humor, that this law was enacted because some men prefer to be considered fathers rather than have no children. One need not be an ancient Roman to see the force of this.

Neither husband nor wife have the right to choose the midwife who must attend the birth, but she also shall be appointed by the praetor. He shall also designate the house of an honest and respectable woman where the alleged mother shall await her confinement.

These provisions are made more stringent, and the surrounding safeguards made more secure, in cases of the other two categories, that is, where a woman either is suspected of simulating pregnancy or where a woman asserts her pregnancy with a posthumous child. In those cases the interested parties, such as heirs, legatees, etc., themselves, or through their lawyers, apply to the praetor for an inspectio ventris, etc. He then appoints five matrons, who must all inspect together at one and the same time. They must pay particular attention that no single one of them alone inspect the woman. This is undoubtedly so ordered so as to avoid the possibility of the substitution of an infant through corruption of one of the matrons. Thirty days before she expects to be delivered the woman may ask to be placed under custody as it were. Three male and three female custodians are appointed to watch over and guard her and prevent fraud. If she wants to take a bath, that also must be inspected before she may be allowed to enter it. During her confinement three lights shall be kept burning continually in the room where she lies, and after birth the child is inspected and guarded by the custodians. Similar rules are observed in the case of a woman condemned to death, and who is, or claims to be, pregnant.

There are other details and rules to be observed, but the above will suffice to illustrate to you the extreme care taken by the Romans to prevent the possibility of fraud by widows or other pretenders.

The law of survivorship deserves brief mention here as bearing to some extent upon physiological theories.

Of father and son who go to war together and die in the same battle, the Roman law presumes the son to die first, if a minor, but the father first if the son is of age.

Of a mother and puber son who perish in the same shipwreck, whenever it cannot be determined who died first, it is more human to believe (the law says) that the son lived longer. But if mother and impuber son suffered shipwreck together, then that the son died first.

These provisions carry their own explanation with them, and may suffice to illustrate the principle.

This Society has heard a great deal about testamentary capacity. A very able and exhaustive paper on the subject was read by one of its members only a short while ago. But the matter is of such importance, and has become such an influential factor in legal discussion, that a not very extended allusion to the Roman law bearing upon it may be considered pardonable.

We all know what a last will and testament is. Yet, in the light of the prevailing mania to set aside wills and to defeat the express wish of testators on slight and frivolous pretexts and flimsy allegations, nothing can be more impressive and beautiful than that short and clear definition of testament by the Roman law: "Testamentum est voluntatis nostrae justa sententia de eo, quod quis post mortem suam fieri relit."

This is the foundation upon which the whole intricate structure of the law of inheritance, legacies, etc., is reared. It is one of the most elaborate and carefully considered, paying the strictest attention and making deliberate provision for the smallest details.

The earliest writers already lay down the maxim that the principal requirement in a testator is soundness of mind: "In eo, qui testatur, ejus temporis, quo testamentum fecit, integritas mentis, non corporis sanitas exigenda est."

This principle once established and recognized, it was obvious that provisions had to be enacted as to the validity of testaments made by persons whose mind was not *integra*. Observe the word "integra." The meaning of this word is not merely "unsound," but it covers almost all the different shades of unsoundness, such as impairment of mental faculties, idiocy, slight temporary derangement, deficiency of senses, or absolute absence of mental power or will.

The Roman law divides persons of unsound mind into *furiosi* and *dementes*, but considers both classes equally incapable of making a valid will except during their lucid intervals.

The latter theory is fully recognized by the Corpus Juris Civilis. It says distinctly and repeatedly that a testament made by a *furiosus* or *demens* during a lucid interval is good in law; but if not made during such, then it shall be bad in law. Neither shall a testament be considered valid if made during a temporary fit of insanity by a person of otherwise sound mind.

It will thus be seen that the Roman jurists comprehended correctly the principle which prevails up to this day, because founded in common-sense. Their dicta are few and short, but they are to the point. They simply denied the right of testamentary disposition to persons who were of unsound mind at the time the disposition was made.

The study and knowledge of the science of mental diseases have

made rapid strides within the last few decades; new principles have been established as applicable to forensic medicine, society, and the individual; the rights of persons and property have received more elaborate and ample protection; but the teachings of the Roman law as to testamentary capacity stand to-day as firmly, as unalterably, as soundly, as if enacted by the most enlightened law-making power of the nineteenth century (by which no reference is made to the Legislature of the great State of New York).

Even the deaf and the mute, and the deaf-mute are not forgotten. At that time instruction for deaf-mutes, which at the present age gives them as good an education as the average school children receive, was unknown. These unfortunate beings were comparatively helpless, and unfamiliar with the affairs of man. To give them testamentary capacity would have been to give them a power which they would not have understood how to wield, and would have made them the tools and mouth-pieces of designing heirs or legatees.

Hence the law was that a deaf or mute, or deaf-mute person could not make a valid will or testament, but it was expressly provided that the will of a person who, after having made it, shall have become afflicted with one or the other of these impairments of his senses, shall be good and valid in law.

Another great question which has agitated the scientific world lately, more perhaps than anything else, is that of criminality, or criminal responsibility. With an increased knowledge of mental diseases, their causes and effects, came also a deeper study and more careful examination of the effects of mental disease upon the human will. The underlying principle of criminal law is the recognition of an intent to violate it. This element is entirely lacking in the Roman law. Like the earlier Roman law-givers, it was an austere, severe, plain, matter-of-fact law, looking at the criminal deed only as it was accomplished, and not upon the motive and intent of the accused. Its ideas of criminal responsibility as impaired by medical causes are meagre, and can hardly be called anything but very slight allusions to the subject. Celsus mentions the subject in a very short and unsatisfactory manner.

We find glimpses of a dawning of this principle in a few allusions contained in the Digest, where mention is made in several passages of the words "doli capax non est," and others of similar import; but this cannot, from the context, be construed as directly alluding to criminal responsibility as impaired by medical or physiological causes. It was vouchsafed to the Canonical law and to the Italian jurists of the middle ages to establish better views and a firmer basis for the theory of criminal responsibility, as they considered not merely the deed itself, but the motives which prompted it, and the criminal intent.

The Roman law alludes only to homicides as affected by the question of criminal responsibility, and it places insane persons and children that have not yet arrived at the age of puberty in the same category.

It says that a *furiosus* who commits a homicide cannot be held accountable for it, by reason of the unfortunate fate which clouds

his reason, and that a child who commits a homicide must be excused by reason of his innocence of wrongdoing.

These provisions are very general and unsatisfactory, as no rule is laid down by which individual cases might be distinguished.

The law says further: An insane person who has killed father or mother is punished enough by his or her insanity. But it significantly adds: "Diligentiusque custodiendum esse, aut etiam vinculis cœrcendum."

How appropriate it would be to enforce this rule in our enlightened age! We allow a murderer to escape on the plea of temporary insanity, and then let him loose again upon society to practise his dangerous pastime, for which he has a convenient and plausible excuse ready. Fortunately the abuse of the writ of habeas corpus was unknown to the Romans; and if they thought a crazy man was dangerous by reason of his murderous propensities, they locked him up and kept him locked up, and, if needs be, used a little coercion of "vincula."

Numerous other provisions of interest in a medico-legal sense might be instanced, but the foregoing has been deemed sufficient to illustrate to you the spirit of the Roman law in matters of forensic medicine, and to explain in a measure the existence of the great and abiding influence which, in this and in other branches, the Roman law has wielded upon the development and progress of jurisprudence and legislation affecting the same. The times and the conditions of men have changed, but the eternal principles of law and justice, as laid down and established in this great codification, stand immutable and unalterable for all times.

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What Constitutes Intemperance.—Lydia McGinley, of this city, brought a suit on a policy for $50,000 on the life of her husband, against the United States Life Insurance Company. The company defended, on the ground that the insured man had represented himself as temperate, when in reality intemperate. Judge Robinson, in Common Pleas, held that to make a man "intemperate," within the meaning of the representation, his drinking must be such as to affect his health or mind. The jury found for the plaintiff, and the company appealed to the Common Pleas General Term, claiming that Judge Robinson's limitation of the word "intemperance" was too narrow.

We should say it was decidedly too narrow for a popular definition. But here is another illustration of the elastic beauties of that favorite legal phrase "within the meaning of the policy." A fellow may guzzle and tipple every hour in the day, and be set down as a confirmed hard drinker by everybody that knows him, but if he has that fortunate faculty possessed by some of his class of carrying a tolerably level head on his shoulders, he is legally a temperate man, at least until visible evidences of decaying health appear. But if he should be one of those unfortunates whose mental poise is upset by a single glass, why then he would be intemperate according to Judge Robinson.—*Insurance Monitor.*

Editor's Table.

Electric Lighting in its Sanitary Aspect.—Illumination by means of electricity, now attracting so much attention at Paris, and at no distant day destined apparently to supersede gas, appears to be, after all, the revival of an old invention. The subject seems to have been first broached by Sir Humphrey Davy more than half a century ago, who used the same kind of combustible material—*coke*—as that with which recent rediscoverers have succeeded.* According to the more recent accounts published in *Nature* and other scientific journals, the next discoverer after Sir Humphrey Davy was a young American named Starr, who patented his invention in England, in 1846, under the title of "King's Patent Electric Light." A full account of Starr's invention, illustrated with drawings, may be found in the *Mechanics' Magazine*, April 25th, 1846.

The "wick" of King's patent was a stick of gas-retort carbon affixed to supports of porcelain. The lamp glass was a thick barometer tube about thirty-six inches long, with its upper end blown out to form a large bulb or expanded chamber. The carbon and its connections were mounted in this with a platinum wire passing through and sealed into the upper closed and expanded end of the tube. The whole of the tube was then filled with mercury and inverted in a reservoir, and thus the carbon stick, etc., were left in a Torricellian vacuum. The current was passed by connecting the electrodes of the battery with the mercury (into which a wire from the lower end of the carbon dipped), and with the upper platinum wire, respectively. The result was a beautiful steady light.

In 1855 electric lighting was taken into consideration by the Commission of the grand Industrial Exposition at Paris with a view to its use on that occasion. But M. Dubosq, who had charge of the experiments, found it impossible to sustain the light for a longer period of time than three hours, hence it was abandoned.†

During the interval from Davy to Lodighin there have been several other experimenters, but until Lodighin, excepting by those already named, there was no substantial progress.

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* Traité d'Hygiène Publique et Privée. Par Michel Levy. Tome II. p. 444.

† Traité d'Hygiène, loc. cit.

In pointing out these anticipations of M. Lodighin's invention, it is not assumed or supposed that any piracy has been perpetrated, but only to designate one of those recurrences of the same idea which are so common in progressive science, and which costs the reinventor and his friends a vast amount of trouble and expense that might be saved if they knew what had been done before. It may be added that the result of the battery experiments was to convince Mr. Starr that a magneto-electric arrangement should be used as the source of power in electric illumination. Mr. Starr died suddenly in Birmingham, in 1846, while constructing a magnetic battery with a new armature which, theoretically, appeared to be a great improvement on those he had used.

Since that time there have been numerous attempts to secure good electrodes for the electric light, as well as devices for adjusting them, but until quite recently all experimenters have fallen back upon the carbon points, pretty much as they were at the first used by Mr. Starr. Within the last five years, however, two notable new lights have been brought out—the "electric light" by M. Lodighin, and the "electric candle" by M. Jablochkoff. M. Lodighin's is designed for general lighting purposes, and was first publicly tried in London, in 1873, having been patented there the previous year. A chief object with him was to overcome the flickering of the light caused by the combustion of the carbon points in the air. This he effected by using a *single* stick (it appears that former experimenters used *two* sticks) of carbon, inclosing it in an hermetically-sealed glass chamber from which the air was previously exhausted, and an ozotic gas, such as nitrogen, which does not combine with carbon at a high temperature, let in. When the current from a magneto-electric machine is passed through this carbon it gradually gets heated to a white heat and emits a brilliant and at the same time soft and steady light. The lights can be made as small as desired, or be safely joined up into series. The flame is continuous and not injurious to the eye, the cost of the new carbon points is saved, and the current can be easily strengthened or weakened at will. It burns equally well under water, and would be very useful for illuminating dangerous mines, there being no fear of explosion from it.

Notwithstanding, the "electric candle" of M. Jablochkoff has, for the nonce at least, quite cast Lodighin's light into the shade. He has restored the two carbon points, but separated them from one another by a slip of insulating substance, such as porcelain, brick, or magnesia, but preferably *kaolin* or pure clay. One of the points of carbon projects a little above the other, and is a little thicker; the

positive current is passed down this and leaps across the air space to the shorter carbon point, thus forming a luminous arc at the point of the *candle*. It is so called because it can be burned upright in a support like a candlestick. The kaolin plays an important part besides insulating the carbon sticks from each other; it becomes incandescent, emitting a beautiful, soft, steady light, and melts away like wax at the same rate as the carbons, just as a candle is consumed by the wick. No mechanism is required for its adjustment. Moreover, M. Jablochkoff has further discovered that the kaolin becomes so intensely incandescent under the electric current that for small and medium lights the carbon may be dispensed with, and by employing a number of separate secondary coils, one to each candle for one primary, the current can be simply and effectually divided. So that by having the carbon candles for large warehouses and public buildings, and small pincher-holders of kaolin wicks for offices and corridors, and by having separate secondary circuits to each set of lights, the passage of the current through the kaolin makes the circuit complete; and electricity may be laid on for illuminating purposes as easily as gas.

In the experiments of MM. Jablochkoff and Denayrouze at the West India Docks, London, about a year ago, in order to show the suitableness of this mode of lighting for dock purposes, the light obtained on that occasion was shaded by ground glass, yet the whole inclosure was brilliantly illuminated for a considerable distance, and each candle was found to be equal to one hundred gas-lights.

The lights as at present used in Paris are chiefly arranged into groups. In front of the Opera-house there are six, and from the posts of each of these extends a heavy telegraph wire to one of the balconies. These posts are also neatly wound around with a wire, and mounted with porcelain or opaque white glass globes. Similar posts extend down the avenue for a considerable distance, about one hundred and fifty feet apart, among the lamp-posts. Suddenly, about eight o'clock, and without any previous warning, these tall white lamps glow with intensity, and the dusky street flashes into sudden glare, brilliant and beautiful. A letter in a recent number of the *Metal Worker*, under date of June 18th, thus describes the scene:

"Every sign on passing omnibus or on the buildings, every detail in the architecture of the houses, every feature of the place stands out in startling colors. The flowers are real, and the trees of lively green; every dress and hat stands out clear and sharp in its true colors as by daylight. The painted beauty of the boulevards dare not leave the gloom of the pale yellow gas. The

electric light is as cruel as the sun, and her shame would be livid in the brightness. Fresh English girls, with roses and cherries won in heathful walks, stand in glad surprise under the strange white lamps, for it is sunlight, and their charms can survive the actinic test with honor. People sit in the restaurants and read their papers. It is like daylight, and it is not necessary to go to the lamp to see the print.

"At the Orangerie, facing the Place de la Concorde, nearly fifty electric lanterns shine among the trees, and light up the concert-hall and restaurant. Standing in the Place the lamps shine like great moons, round and clear white. The concert-garden sign is visible precisely as by daylight, and all the trees stand out clear and green against the darkness. The trees to the left, beyond the gate, make simply black masses, and the gas-lamps among them look like small yellow stars. Within the garden the effect is most singular. The trees and flowers are plainly visible in every detail of leaf, petal, and twig. The very stones of the gravel walk, the mosses on the walls, every stain and mark on the statues are visible, as by day. Within the concert-hall the effect is quite peculiar. The room is about 100 by 50, and quite lofty, and yet four candles placed on posts about ten feet high are sufficient to make the room lighter than it is by day. That is, there is more light than comes in by the windows in the daytime. Six lights are used, two extra lamps being placed in the orchestra; but in the adjoining hall, a room of the same size, four are sufficient for all practical purposes. The orchestra fills the stage, and a large audience occupies the floor. People are reading the finely-printed programmes with ease, even at a distance of fifty feet from a lamp, and the band read their music with security. The wide doors are open, and more electric candles under the trees, where a large portion of the audience is seated at the little coffee tables, make it almost equally light there. Here, again, the actinic effect of the light is remarkable. The ladies' dresses appear in their real colors, the blues and greens holding their true shades as by day. There are no gas-lamps, and the only light is from the white globes that shine so silently. It is not at all unpleasant to watch the lights, for, though bright, they are not painfully intense. They burn with remarkable steadiness, the only changes being an occasional lessening of the brilliancy and a strange alteration in the color, the globes sometimes assuming pale shades of blue and red. This may be in part an optical illusion, resulting from fatigue in the eye, but it is certain that unless the lamp is steadily watched there seems to be absolutely no change in the quantity or color of the light in the room. Once,

while looking at the lights, four of them went out, leaving only two in the room. This was still sufficient to enable any one to read in any part of the hall, but a workman at once came in, and, opening a wooden box at the base of each lamp-post, corrected the difficulty, and the lights sprang up again in mysterious silence."

The power of being able to divide up the current so as to have several circuits with several candles of various degrees of illuminating effect in the same circuit, or only one, gives to electricity all the conveniences of gas, at less expense, and, what is of much greater importance, with far less pernicious and dangerous consequences to health.

Every cubic foot of illuminating gas burnt consumes from two to two and one-half cubic feet of oxygen, and produces two cubic feet of carbonic acid hourly. An ordinary burner consumes about forty-five cubic feet of oxygen, or as much as three full-grown men every hour. And besides the consumption of oxygen and substitution of carbonic acid in its place, owing to common impurities, illuminating gas not unfrequently gives off sulphurous acid, and sometimes the still more deadly poison, carbonic oxide. These impurities, added to the heat and moisture common to the excessive use of gas in churches, opera-houses, theatres, and other large assembly buildings and halls, and various working establishments, explain the terribly oppressive stuffiness commonly experienced in such places, and accounts for various ill effects well known to all observing physicians. Other means of lighting hitherto used, for equivalent amounts of light, are equally deleterious. Two ordinary sperm candles burning in a room consume about as much oxygen and exhale about as much of impurities as one man; tallow candles—of equivalent light—a fourth more. Kerosene oils, while equally deleterious, so far as the consumption of oxygen and the giving off of carbonic acid and smoke are concerned, add explosive gases, which in the United States alone cause not less than two hundred deaths annually. In estimating the sanitary bearings of artificial light, therefore, it is evident that other important conditions besides brilliancy have to be taken into account. To calculate the quantity of air necessary to be supplied to buildings and rooms used for assembly halls, workshops, or sleeping apartments, the kind, quality, and quantity of light are all important considerations. Heat, too, has to be taken into account for lighting buildings, the distance at which a sufficient quantity of light may be supplied without inordinately heating the apartment. It is evident, therefore, that for domestic use, no less than public lighting, electric light possesses advantages superior to any other means hitherto devised.

Street Dirt.—The New York Board of Health has issued a preliminary report (the President's brief of the report in detail hereafter to follow) for the period of eight months ending with December 31st, 1875, summarizing the vital statistics, unsanitary conditions, milk analyses, the complications and conflicts which have embarrassed the actions of the Board for the time in reference to the Harlem Marshes and other nuisances noticed contemporaneously in THE SANITARIAN, and giving some *opinions* which appear to be inconsistent with the scientific knowledge reasonably supposed to underlie them. A table of twelve analyses of street dirt is given, which shows an average of: Water, 3.032; organic volatile matter, 28.454; mineral matter, 68.514; nitrogen, 0.369. From which "*it is apparent that the amount of manure in street sweepings is not sufficient to interfere with their use for filling sunken lots, and the idea that they are sufficiently rich in fertilizing material to have a pecuniary value is not sustained. Ashes are worthless as a fertilizer.*" (The italics are the Editor's.) This opinion is soon after followed by a communication of the Board of Police, May 28th, 1875, setting forth "the right and power to deposit such portions of the dirt and ashes collected by the Bureau of Street Cleaning as may be suitable and requisite for filling in low and sunken lots, and approved by the Board of Health," and a resolution requesting the Board of Health to express its judgment "as to the suitability of the material" (street dirt), at that time being, or such as subsequently may be delivered by the Street Cleaning Bureau, and made use of for the filling in of low and sunken lots in this city. This resolution of the Police Department was promptly referred to the Sanitary Committee of the Health Department. Ten days thereafter, June 8th, the Sanitary Committee submitted an emphatic report reciting the condition and dangers of the effluvia of that portion of the region in question which had previously been filled in with street sweepings, and concluded with:

"Finally, they would report that they consider that the only material to be used in filling should be either clean ashes or fresh earth and stones." The report was approved of and endorsed on the day it was made by the following resolution:

"*Resolved*, That in the opinion of this Board there is no material, save fresh earth, better adapted for filling these sunken areas than clean coal ashes, and that the Board of Police be respectfully requested to collect these ashes, free from garbage and street sweepings, and send the same to this district."

Moreover, in regard to the insufficiency of manure in street sweepings, and the worthlessness of ashes as fertilizing material,

few persons have the credit of knowing more about the importance of ultimate analyses in compound substances, in order to arrive at practical results, than Professor Chandler, President of the New York Board of Health; and that he should endorse such an evidently incomplete analysis of *street sweepings* "by the chemist of the Board" as the one given, is only a little less astonishing than his opinion of ashes. In the one case, the large percentage of "mineral matter," without any information in regard to the proportions of silica, lime, soda, potash, magnesia, or other mineral therein contained, useful or otherwise to plants; and of ashes (assuming that the President of the Board means coal ashes only), he virtually states that silica, lime, magnesia, and alumina,* of which coal ashes chiefly consist, are of no use to plants, and consequently worthless to the agriculturist. Not to give the President of the Board of Health the credit for knowing better would certainly be to do him great injustice. It may be that the attributed insufficiency of street sweepings and the worthlessness of ashes is because of the small percentage of nitrogen in the one case, and of its total absence in the other; nitrogen being an acknowledged necessity to the perfect nutrition of plants. Plants may be furnished abundantly with all needful salts, carbonic acid, and humus from a variety of sources, but they can never be made to attain complete development without nitrogen. It is the *sine qua non* of healthful and productive vegetation. Rarely or never, however, does any one kind of manure represent all the qualities necessary for the food of plants. The essential foods are supplied from a variety of sources—soil, water, and air; and no nutritive element is more variable in manures, or more frequently absent in some of those ordinarily deemed to be the most valuable, than nitrogen. For example: the excrement of horses ordinarily contains none, or only a trace; 100 parts of fresh cow excrement contains only 0.506, not quite one-third more nitrogen than the average of the analyses of the "chemist of the Board of Health"; and in the excrement of other cattle there is frequently none. It varies according to the food of the animals.† In short, the value of street sweepings and ashes for agricultural purposes is, as indicated by the composition of these substances and the physiology of plants, beyond reasonable question. Therefore, between the power of the Board of Health to free street

* The ash of Boghead coal consists of 71 per cent. of silica, the rest being lime, magnesia, alumina, and a minute quantity of iron, in union with sulphur.—*Antisell on Photogenic or Hydro-Carbon Oils*, p. 26.

† "Chemistry in its Application to Agriculture and Physiology." By Justus Liebig, MD., Ph.D., F.R.S., etc., etc. Edited by Lyon Playfair. Page 60, et seq.

sweepings and ashes as ordinarily collected from putrefactive qualities by incineration, and thus make them fit for filling purposes, and the availability of these substances for agricultural uses; there seems to be no good reason why their continued dangerous uses as hitherto should not be prohibited by law.

Brooklyn Health Authorities have issued a peremptory order, and stationed a special policeman to prohibit any further use of street dirt for filling purposes. But no effective measures have yet been taken by the Commissioners of City Works—to whom the subject is said to belong—to put a stop to the pollution of the water supply by Hempstead filth, which continues to drain into the receiving reservoir.

Long Island City is at last, apparently, awake to the importance of self-protection against being any longer used as the common dumping-ground of New York street dirt and manure, and the continuance of ammonia and other factories on Newtown Creek, which *add* to the foul odors of the neighborhood. Against this action of the public authorities the dirt and manure contractors and ammonia manufacturers take exception, because

Newtown Creek, which is the division line between Brooklyn and Long Island City, is the open sewer into which several Brooklyn sewers and numerous cow-stable, slaughter-house, rendering establishment, and distillery drains from both cities empty. The whole is kept in commotion by a lively commerce, the continuous passing and repassing of tow-boats with their trains—a veritable bubbling stream of stench between the two cities, which it is impossible further to befoul. It is barely possible that the people in the vicinity of this river of pollution will continue to tolerate it for some time to come, until its foul odors, or some still more potent messengers of death, reach the respective city halls of these two cities; but that it will much longer tolerate human life thereabouts is altogether beyond the bounds of probability.

Brooklyn Rapid Transit via Long Island Railroad.—As an offset to New York the people of Brooklyn were quick to see that without some means of speedy communication with the country they would lose their hold on the inset of the tide of population from the other side of the river. To this end legislative authority was obtained for the organization of the Kings County Elevated Railway Company, which made haste with its surveys; but ere the subscription books were opened (July 23d), the public, and particularly that portion of it living on the line of the proposed route, had become so impressed with the noise and other inconveniences likely to grow out of the enterprise, that that which was at first a matter of lukewarmness speedily ripened into open opposition, and threat-

ened legal contest. Meanwhile the Long Island Railroad Company, already in communication with the whole interior of the island, under the inspiration of officers thoroughly alive to the main chance, penetrated to the very heart of the city, and from thence lost no time in establishing new lines of connection with the sea-shore, and opening up facilities for country residences and resorts for health and pleasure far surpassing anything possible for New York, and completely overwhelming the whole project of elevated roads for Brooklyn. No wonder that with such a facing the subscription books of the proposed Kings County Elevated Company should be, according to the *Eagle*, left severely alone, and that the commissioners are pursuing their ordinary occupations, each one, no doubt, convinced that nothing will come of their work. But one more step seems to be necessary on the part of the Long Island Railroad Company for the completion of its opportunity—the fulfilment of its speedy destiny to the relief of Brooklyn, and to again turn the tide from New York—continue the line to South Ferry. Surely everybody familiar with Atlantic avenue before and since it was used for a steam railway appreciates, by this time, its most useful relations to Brooklyn in general, and to the people who own property in the vicinity of that thoroughfare in particular. All the promised improvements by the half-dozen of store-keepers who were the prime movers in the mistake of estopping the steam rail conjunction with South Ferry, twenty years ago, have utterly failed. The same opponents of public weal, whose local interests are confined to a distance of only two blocks—and these on that portion of the avenue which would maintain continuity of surface above the tunnel—are opponents now.

Such influences should not prevail a second time. Not alone the business, but the health, of thousands of people in that part of Brooklyn and the lower portion of New York would be benefited by the increased facilities of getting to the country, which reopening of the tunnel and the continuance of the Long Island Railroad to the ferry would give them; and the sooner this benefit is conferred the better for the whole people.

The New Jersey State Board of Health* in its first annual report lays an excellent foundation for future sanitary work by a sketch of its origin and organization, by E. M. Hunt, M.D., Secretary; a paper on Vital Statistics, by E. J. Marsh, M.D., President, which shows that while New Jersey has had a registra-

* Report of the Board of Health of the State of New Jersey, 1877. I. Members of the Board—Ezra R. Osborne, Elias J. Marsh, Laban Dennis, Cyrus Brackett, James M. Ridge, Theodore R. Varick, Ezra M. Hunt, Hon. H. C. Kelsey, Secretary of State, and Hon. John P. Stockton, Attorney-General, *ex-officio*.

tion law for nearly thirty years, and spent thousands of dollars in carrying it out, the records are wholly worthless and inaccessible. Various methods of improvement are suggested. The general importance of vital statistics—what and how facts should be obtained and reported, and the manner of preserving them. Report on the Home and the School in their Relations to Health, by Ezra M. Hunt, M.D., Secretary, rehearsing in detail patent evils, only equally common to houses and school-houses throughout the country as to New Jersey, where no thought whatever has been given to the care of the health of the inmates. Domestic Hygiene, by J. M. Ridge, which briefly recites the importance of fresh air, pure water, and clean soil; and the alterations and pollutions common to these essential conditions to health. Report on Epidemics and Endemics that have occurred in New Jersey since 1870, by Theodore R. Varick, M.D.: an instructive summary of medical observation for the last seven years, showing much careful inquiry into the causes of disease throughout the State, and their relation to the nature of the soil, social relations of the people, seasons and weather, and houses. Notes on Localities Injurious to Health by Reason of Imperfect Drainage, by George H. Cook, Esq., State Geologist of New Jersey. This paper, particularly, points out the common causes of malaria, the area of the "drowned lands" in the State, and their long known insalubrity.

Following these special reports and papers are meteorological tables, showing the temperatures, rain-fall, etc., at Newark, 1873 to 1877; reference to former State laws bearing on public health, and the Act establishing the State Board, which forms the subject of this report.

Illinois State Board of Health has been in operation one year; has had thirteen meetings in various parts of the State; has issued certificates to 4,950 physicians and midwives, each of which is signed by its seven members; has examined 366 applicants for the license to practice, and rejected 221 of them; has driven 1,200 unqualified practitioners out of the State; has stopped eight colleges from giving two graduating courses in one year; has refused to accept or to recognize the diplomas of eight medical schools; has revoked six certificates for gross unprofessional conduct and advertising; and at its meeting in Decatur, June 27th, authority was given to revoke the certificate of another physician, accused of being an abortionist, in case the facts presented were proven. It gives me great pleasure to state that, in every particular, and without exception, the "mixed board" has worked harmoniously.

Yours, etc., R. LUDLAM, M.D.,
—*Medical Investigator.* Member State Board of Health.

Death-rates per 1,000 inhabitants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Pox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Type Fevs	Malarial Fevers.	Diarrhœal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500—4 weeks ending July 20..	2790	33.53	1663	306		49	71	14	19	35	11	34	980	30	386
Philadelphia, 850,900—4 weeks ending Aug. 3...	1534	23.50	891	171		25	34		7	10	16	2	337	2	58
Brooklyn, 528,000—5 weeks ending July 27.....	1460	27.45	878	135		16	9	11	7	30	8		499	16	84
St. Louis, 500,000—4 weeks ending July 27.....	837	21.75	371	48		9	4	4	2	8	11	42	95	3	30
Chicago, 460,000—5 weeks ending Aug. 3.... ...	1168	26.47	779	68	3	10	5	1	3	37	17	4	356	7	62
Baltimore, 350,000—4 weeks ending July 27.....	620	18.47	311	86		14	14		3	6	18	3	121	1	31
Boston, 363,000—4 weeks ending July 27.....	699	25.09	355	76		37	2	32	6	9	9		154	6	
Cincinnati, 280,000—3 weeks ending July 20....	374	23 38	187	27		5	25		1	4	7		69	2	16
San Francisco, 300,000—month of June... ...	368	14.93	150	57		7	3	2	2	10	6		23	2	
New Orleans, 210,000—3 weeks ending July 27..	396	32.77	128	49	4	5			1		2	43*	27	2	25
Washington, 160,000—month of June..	426	32.70	250	54		4	10	4	2	3	9	6	88	2	20
Pittsburgh, 145,000—.....															
Newark, 126,000—.....															
Providence, 100,000—month of July	208	23.90	111	21		6	11		1	6	4		48	1	10
Milwaukee, 123,000—															
Rochester, 70,000—month of July.....	94	15.81	50	13			3				1				4
Richmond, 77.000—4 weeks ending Aug. 3.....	144	24.37	70	20			11				3	1	25		13
New Haven, 60,000—month of July..... ..	131	26.2	69	17			2		1		1	1	42	1	2
Charleston, 57,000—5 weeks ending Aug. 3.....	157	33.73	75												13
Toledo, 50,000—month of June.....	35	8.40	15	5		1	2			1			1		1
Mobile, 40,000—month of June	76	23.01	28	10								2	4		5
Dayton, 36,000—4 weeks ending Aug. 1.....	48	17.38		4						1		2	11		1
Nashville, 27,000—.....															
Wheeling, 28,000—.....															
Buffalo, 170,000—.....															
Knoxville, 13,000—															
Paterson, 40,000—months of May and June.....	134	20.04	58	21		2	4	1	2	2	1	1	2		
Petersburg, 20,000—..															
Salma, 8,000—month of June.....	23	39.08	11												3
Elmira, 20,000—month of July	44	27.51	23	5		11			1				6		2
Yonkers, 18,500—month of July.....	34	21.63	16	2	†		2						13		1
Memphis, 45,000—.....															
Detroit, 115,000—.....															
Syracuse, 60,000—.....															
Reading, 40,000—															
Sacramento, 25,000—month of June....	44	21.4	17												
Minneapolis, 44,000—month of June.....	29	8.0	9	9										1	
Bowling Green, 6,000—.....															
St. Paul—.....															
Cleveland, 162,000—2 weeks ending June 29....	92	14.8	56	8		2				1	2		11	2	7
Erie, 27,000—year ending March, 1878.....	349	12.9	168												39
Jacksonville, 10,000—6 mo., ending June 30....	57	11.49	11	21					1		1	3	1		

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Correspondents under this head are particularly requested to forward their communications *regularly*.

* Yellow fever, 26. † Small-pox, 1; last month's report was an error.

Charleston, S. C., presents an unusually favorable health report for the year 1877;* but, we regret, without a recent estimate of populations—white and colored, native and foreign. And more might have been said of the domestic conditions in general with profit to all interested in the relation of such conditions to health.

Of the municipal condition, in general, privy vaults, insufficient drainage, neglected stench traps, and plank streets, are deemed to be the chief existing causes of disease—inviting to epidemics—and urged upon the attention of the City Council. Enormous quantities of disinfectants have been used with unquestionable benefit; but these are a poor reliance in default of cleanliness, and the difference in pecuniary cost sooner or later always tells in favor of *cleanliness first*—disinfection as a finishing touch.

The sanitary results for the year are summed up with a conciseness which shows a thorough acquaintance with the work, and an evident desire to economize both space and expense.

Births.—White: males, 41; females, 40. Colored: males, 37; females, 43; total, 161.

Marriages.—Whites, 25; colored, 23; mixed 1; total, 49.

Deaths (including still-births).—Whites, 555; colored, 1,258; total, 1,813. Of this number 863 were of infants and children under ten years of age. As compared with the previous year there was a decrease—of whites, 113; colored, 86.

Ratio of mortality, 1877: 1 in 44.19; 1876, 1 in 36.71 per 1,000 of population.

Chief Causes of Death.—Whites: consumption, 57; diphtheria, 47; diseases of heart, 18; convulsions, 18; dropsies, 17; typhoid fever, 15; congestion of lungs, 15; trismus nascentium, 15; still-births, 27. Colored: consumption, 167; dropsies, 81; marasmus, 61; trismus nascentium, 60; convulsions, 51; old age, 47; pneumonia, 32; paralysis, 28; congestion of lungs, 24; locomoter ataxia, 24; typhoid fever, 22; diseases of heart, 21; debility, 21; diarrhœa, 18; diphtheria, 18; still-births, 156.

The mortality among colored children particularly "is fearful," but not due to any prevailing epidemics, from which the city has been exempt. It is "attributed to neglect, carelessness, and the want of that supervising care formerly exercised over them, as well as of nutriment necessary to the invalid and helpless infant."

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* Annual Report of the City Registrar; comprising returns of Deaths, with a Classification of Disease, Age, Sex, Status, Nativity; with Meteorological Abstract, etc., for the year ending December 31, 1877. Together with Annual Reports of Health Department and City Hospital. By Robert Lebby, M.D., City Registrar. Charleston, S. C., 1878.

The City Hospital reports the care of: white inmates, 741; colored, 889;—1,630. Discharged: of the former, 617; of the latter, 673;—1,290. Deaths: white, 59; colored, 142. Percentage of mortality: whites, 7.96; colored, 15.99; total, 11.96. The difference between white and colored is attributed to the "low grade of most of the colored people, who suffer extensively from the combined effects of deprivation and neglect, as well as disease, before their admission, often dying from exhaustion within a short time thereafter." In connection with the City Hospital service, 142,212 loaves of bread were distributed during the year: to the Orphan-house, 52,242; Almshouse, 27,953; Main Station-house, 3,840; Ashley River Asylum, 14,696;—at a total cost of $5,930.75. The total cost of the City Hospital in all its departments for the year was $30,000.43. Receipts for the care of seamen, private patients, and Charleston County for sick poor, and credits for bread furnished other institutions, $10,258.93. Actual cost to the city, $19,741.50. Gross cost per capita per diem, 56.3 cents.

The county of Charleston is indebted to the Hospital for the care and support of sick paupers to the amount of $16,597.75, the payment of which is urged by Dr. Buist, the physician in charge, as a sacred duty, under existing contracts of the city authorities with the institution.

By the meteorological observations of the Signal Service Bureau, M. McGauran, Observer:

Barometer—Annual means: 30.076; highest, 30.532; lowest, 29.607; difference, 0.777.

Thermometer—Annual means: 66.4; highest, 83.8; lowest, 47.7; difference, 36.1.

Rain—Annual means (in inches): 6.51; maximum (April), 15.00; minimum (May), 2.71; mean relative humidity, 71.4.

Toledo is one of the best examples of sanitary administration of any city in the United States. By the report of the Board of Health for 1877, on an estimated population of 50,000:* *Births* recorded (incomplete returns), 402. *Marriages*, 470. *Deaths*—including premature and still-births—715. Ratio of deaths per 1,000 of population, 14.08. Zymotic diseases killed 222; consumption, 75; these two causes only show an increase over the previous year: the former chiefly owing to an outbreak of diphtheria in a public school, and apparently in consequence of the criminal ignorance displayed in the syphon connection between the drinking-

* Annual Report of the Board of Health of the city of Toledo. A. W. Fisher, M.D., Health Officer and Secretary of the Board. Year ending December 31, 1877.

water cistern and the privy vault. Of the whole number of deaths from diphtheria, 45 (37 more than occurred in the previous year), nearly one-third were among the pupils of this school. The Board of Health deserve great credit for the promptitude with which they closed the school and proceeded to remedy the defect and purify the building. The report contains a lucid description of the defective conditions common to such buildings, together with a sketch of the common results, in filth diseases, particularly diphtheria and typhoid fever, and the importance of pure drinking-water. A brief essay on milk also adds value to the report, which is, altogether, a valuable one for distribution among the people generally, and particularly among school trustees.

Baltimore, for the period of fourteen months, ending December, 1877,* reports: Population, 267,354. *Births*—year ending with October, 6,847; November and December, 912: 7,759. *Deaths*—(exclusive of 550 stillborn) year ending with October, 7,936; November and December (exclusive of 97 stillborn), 1,086, 8,022—4,472 under five years of age. Death-rate per 1,000, 20.79. Chief preventable causes of death: Consumption, 1,299; diarrhœal diseases, 774; scarlet fever, 597; diphtheria, 455; whooping cough, 310; typhoid fever, 240; marasmus, 192; measles, 161; dentition, 153, and croup, 156: a proportion which is very discreditable to a city so favorably situated. Notwithstanding, a large amount of work is reported, and some new facilities added. But the vilest of all sources of preventable diseases still obtain, the abominable system of privy vaults, without any means for the disposal of the soil removed therefrom; "being deposited wherever a place can be found in the surrounding suburbs of the city to receive it." The Commissioner suggests a contract system for its removal "to a point beyond six miles from the corporate limits of the city, . . . either by water or rail, in a cleanly and odorless manner." The garbage system, in particular, is deemed to be complete, and eminently satisfactory. The General Superintendent of Streets (Assistant Commissioner of Health) gives a summary of the amount of work done, and cost of the same: Loads of garbage removed (fourteen months), 131,687; street dirt, sand, ice, snow, etc., 249,135—380,822; average cost per load, 58 cents. Total amount expended for collecting and removing garbage, street-dirt, sand, ice, etc., scraping and sweeping

* Annual Report of the Board of Health to the Mayor and City Council of Baltimore for the fourteen months ending December 31st, 1877. According to resolution of City Council, since last Report, the fiscal year—which had previously been otherwise—was made to conform to the calendar year. James A. Stewart, M.D., Commissioner of Health.

the streets and the several market-houses, including tools, etc., $220,719.08. Dr. E. Lloyd Howard, Marine Hospital Physician, reports a gratifying condition of the Quarantine Station, and total protection of the city throughout the fourteen months from the diseases of commerce; expense of maintenance, $20,033.07.

Richmond, Va.,* reports for the year 1877 a population of 77,500—white, 44,500; colored, 33,000. *Births* recorded, 1,904—whites, 1,013; colored, 891; still-births, 153—whites, 43; colored, 110. The proportion of still-births to those born alive was one to twelve—of whites, one to twenty-three; colored, one to eight. *Marriages*, 510—whites, 275; colored, 235. *Deaths*, exclusive of still-births, 1,649—whites, 690; colored, 959. Death-rate per 1,000 of entire population, 21.27—whites, 15.54; colored, 28.67. *Chief fatal diseases*—whites: consumption, 94; diarrhœal diseases, 98; pneumonia, 24; heart diseases, 21; scarlatina, 20; typhoid fever, 18; diphtheria, 13. Colored: consumption, 159; diarrhœal diseases, 103; convulsions, 57; pneumonia, 48; atrophy, 39; teething, 33; heart diseases, 32; typhoid fever, 27; trismus nascentium, 17; dropsy, 17; diphtheria, 9. Under five years of age, 738—whites, 274; colored, 464. Special attention is called to a marked decrease in the number of deaths from *miasmatic* diseases in the past year, attributed to the increased cleanliness of the streets, by the assistance of the Fire Department, and facilities afforded by the railroad companies to meet the emergency in the river overflow in the month of November. Independently of the aid accessible to meet such emergencies, the President of the Board, Dr. J. G. Cabell, urges an increase of the *chain gang* force, as an economical and efficient working force; beneficial alike to the public and criminals supported at the public expense. Soil saturation, in a well-defined district, some foul wells and privy sinks, and certain sewer defects, which have been allowed to exist, are pointed out as chief causes of insalubrity, and their abatement urged. The report is an admirable one for its concise clearness of statement of work done, and excellent practical suggestions for the future.

Foreign Mortality.—Ratio per 1,000 inhabitants annually. July 14–20: London, 26.1; Glasgow, 28.5; Liverpool, 28.4; Birmingham, 22.6; Manchester, 29.8; Dublin, 23.4; Leeds, 22.4; Sheffield, 27.0; Edinburgh, 19.9; Bristol, 19; Belfast, 23.7; Bradford, 14.7; Salford, 24.2; Newcastle, 20.9; Hull, 26.2; Cologne, 23.2; Frankfort-on-the-Main, 25.03; Dantzig, 19.3. July 7–13:

* Annual Report of the Board of Health of the Births, Marriages, and Deaths, in the city of Richmond, for the year 1877. J. G. Cabell, President of the Board.

Stuttgart, 15.4; Strasbourg, 32.6; Nuremberg, 21.2; Barmen, 19.1; Magdeburg, 24.1; Altona, 29.7; Elberfield, 34.3; Dusseldorf, 29.08; Stettin, 36.9; Chemnitz, 27.7; Aix-la-Chapelle, 23.8; Brussels, 23.6; Anvers, 20.7; Gand, 26.4; Vienna, 25.8; Buda-Pesth, 39.7; Prague, 26.3; Trieste, 39.1; Lemberg, 30.6; Stockholm, 19.1; Christiania, 19.4; Odessa, 79-9; Venice, 16.7; Bucharest, 25.0; Amsterdam, 24.2; Rotterdam, 21.8; La Hage, 25.0. Month of June: Marseilles, 28.1. June 30–July 6: Berlin, 56.4. May 16-31: Lille, 25.6. July 10–16: Copenhagen, 21.1. June 30–July 6: St. Petersburg, 48.2; Alexandria, 49.8. May 26–June 1: Rome, 21.8. June 18–24: Naples, 36.3. Month of May: Milan, 28.5: Genoa, 25.5; Bologna, 27.2. June 23–29: Lisbon, 27.5. May 1–15: Rio-de-Janeiro, 54.9. June 2–8: Calcutta, 32.6. June 12–18: Bombay, 35.7. June 11–17: Madras, 35.8.

Yellow Fever.—Just after our August number went to press a good deal of excitement was created in Brooklyn by the report that yellow fever had broken out on board the U. S. receiving ship *Vermont* at the Navy Yard. July 12th to 18th, eight cases in all occurred, three of which were fatal.

According to the investigations of the health authorities and the report of a board of medical officers of the navy, the disease seems to have "originated from the ballast of the bark *Juanita Clar*, which left Havana May 1. This ballast, quarry clippings and sand, was deposited on the dock, on either side of the *Vermont*, and about one hundred yards distant from her."

Prompt measures were taken by both authorities for the speedy disinfection of the filthy ballast, and covering it over with fresh earth, since which time there has been no recurrence of the disease, a circumstance which should be particularly impressed upon the attention of the authorities of several of the cities and towns on the Mississippi, recently guilty of the most inhuman conduct towards the people of New Orleans. If yellow fever were personally contagious, the disinfection of a mass of filth, a hundred yards distant from a ship's company in the midst of which eight cases had occurred, would surely not have prevented their companions from taking the disease. Yet in face of this, and hundreds of similar illustrations of the non-contagiousness of yellow fever from person to person, the civil (?) authorities of Vicksburg, Memphis, and of other cities refuse hospitality to *well* people from New Orleans! They virtually say to those who would for safety fly from infected places, as the surest and most speedy means of escaping the disease, go back and die! Meanwhile these same authorities habitually live in the indulgence of banks of filth—fever nests—liable at

any time, under propitious weather, to poison the multitude. Alas, alas, that there should at this day be any such persons deemed to be intelligent and humane!—that there should be any people at all in civilized communities so like those who suffered a just retribution while peeping through the key-holes of their houses, amidst filthy surroundings, at the fugitives from London, two hundred years ago! *They* were excusable; *they* did not know, as intelligent people are now supposed to, that filthy vessels and filthy surroundings, and not the persons who run away from such filth, are the real sources of danger.

OFFICE SURGEON-GENERAL U. S. M. H. S., Washington, August 10th, 1878. Abstract of sanitary reports received during past week, under the National Quarantine Act:

Port Eads.—Yellow fever has appeared at Port Eads, mouth of Mississippi, on 5th inst. Thirteen cases, but no deaths to yesterday noon.

New Orleans.—Since last report, 236 cases yellow fever and sixty-five deaths, making 431 cases and 118 deaths to yesterday noon. At *Cincinnati* there have been only two cases of yellow fever (one previously reported), both from New Orleans—one fatal. A young man arrived at

Memphis from New Orleans, July 30th, who died of yellow fever August 3d.

Steamer *Golden Crown*, from New Orleans, had one case of yellow fever on passage up—a lady, who died on board and was buried at

Caledonia, Ill., August 4th. Two deck hands, supposed to have yellow fever, landed at

New Albany, Ind., July 25th, proved, upon investigation by Surgeon Long, of this service, not to have had that disease. On a steamer at Vicksburg a case arrived from Cairo, originally from New Orleans; died of yellow fever, August 9th.

Key West.—No new cases of yellow fever reported during the past week.

Havana.—239 deaths from yellow fever and twenty-one from small-pox, during two weeks ending August 3d.

Matanzas.—From July 26th to 29th no yellow fever cases, but on 30th four new cases were reported in bay, and others have since occurred daily to August 2d, date of advice.

Cardenas.—Yellow fever in city, but not yet among shipping.

Sagua-la-Grande, Cuba.—One fatal case of yellow fever in shipping.

Bombay.—Twenty-six deaths from cholera, week ending June 18th.

Malta.—Outbreak of cholera on British troop-ships from India was brought under control by authorities, and disease did not lodge in Malta. Advices to July 18.

Reports from other places indicate good health.

JNO. W. WOODWORTH,
Surgeon-General U. S. Marine Hospital Service.

Vienna.—Published health reports show a decided improvement in the year 1877 over the preceding year. The total of deaths was 20,606, a decrease of 625, or 2.9 per cent. Reckoning the population at 696,760, we have therefore a death-rate for 1877 of 29.57 per 1,000, against 30.45 in the year 1876. It is claimed, however, that 2,540 of the deaths reported in 1877 were those of strangers brought sick to Vienna hospitals from beyond the confines of the city, and therefore not due to local influences. This consideration reduces the death-rate to 25.9 per 1,000.

The healthfulness of Vienna has been constantly improving since 1872, and the following comparison of death-rates for 1877 will show that this city may now be counted among the healthier centres of population in the world: Frankfort-on-the-Main, 20.2; London, 22.4; Leipzig, 23.6; Paris, 23.9; New York, 24.5; Vienna, 25.9; Hamburg, 28.6; Brussels, 29.6; Berlin, 29.8; Naples, 32.3; Munich, 34; Trieste, 34.6; and Pesth, 40.1.

The death-rate of Vienna from 1853 to 1867 was 38; 1867 to 1870 it fell to 32.1; in the years 1871 to 1873 inclusive it was 32.5; and in 1874 to 1877 the average has been 26.13, a noteworthy improvement in 25 years.

During the past year there has been an increase of deaths resulting from tuberculous diseases amounting to 400; while the deaths from miasmatic contagious diseases have fallen off 976; from diseases of the respiratory organs, 168, and from complaints of the digestive organs, 164.

A remarkable event in the record of Vienna epidemics was the appearance of the *abdominal typhus*, which broke out in February, and by the end of April, after causing 347 deaths, had altogether vanished. This destructive epidemic is, by competent judges, attributed to unusual disturbances in the water-supply system of the city, occasioning chemical action in certain stagnant water-pipes, and thereby in some measure poisoning the drinking-water of the city.—*Fremden-Blatt.*

Mauritius.—Annual reports on the vital statistics for 1877 have been published, and they afford information of a unique and phenomenal character. At the end of the past year the total population was 348,625, of whom 237,468 were Indians. The male population exceeds the female by nearly 50 per cent., and among the Indians, especially, there are 169 men to every 100 women, a disproportion the reverse of what rules in general settled populations. The marriages "equalled as many as 1,187, being the largest number ever celebrated in one year." The registrar attributes this increase of marriages to the fact that the Indians "are under the impression

the New Curatelle Law provides that if they are not *legally* married—although as a rule the Indians are all married according to the rites of their religion—their wives and offspring will not inherit their property." The *Mercantile Record* thinks this is a very proper explanation, and "tends to show that the preachings of ministers of religion have failed to do what a natural anxiety to guarantee the succession of property has done, and that, collaterally, morality with most folk is not clearly so powerful in its influence as are pecuniary considerations." The Governor granted during the year fifteen marriage dispensations, of which two were issued to uncles marrying their nieces, one to an aunt marrying her nephew, and one to a man marrying his deceased wife's sister. The birth-rate for the year was 35 per 1,000, but of every hundred of these 67 were illegitimate. Of the total births every one in 12 was a still-birth. In both these respects the proportions are enormous, and are unparalleled in any country existing under civilized and Christian laws. The death-rate exhibits similar startling proportions, and if the existing state of things should continue, would amount to actual decimation. At Port Louis the rate was 41.9 per 1,000, and the general rate among the Indians 49.6. The deaths among the males exceeded those of the females by 17 per cent. These remarkable figures are recorded, but they are all yet to be explained, and so far even the local statisticians fail to account for the phenomena. Among the causes of death fever has made an advance, and the deaths from *leprosy* have increased from 12 in 1868 —a year after it had broken out—to 85 last year.—*Cape Argus.*

Congres International d'Hygiene de Paris.—Du 1er au, 10 août, 1878. Avec le patronage du Gouvernement Français.

The committee appointed to arrange the discussion of each of the six questions have made their respective reports. The six fascicles make an aggregate of 425 pages, and the facts presented for discussion, with the facts and details given, are of a most interesting and important character.

On the first question—Hygiène du nouveau-ne—the committee consists of ten members, there are three reports. In the first report M. Bergeron states that in some parts of France the mortality in children, under one year, has been as great as 90 per cent.; that of 20,000 infants sent annually to the country from Paris 15,000, 75 per cent., died under the age of one year; that of the 54,000 children born in Paris annually, more than the half die within the year; and that the average death-rate under one year, for the whole of France, is between 18.2 and 21.7 per cent. While the mortality among infants is greater in France than in the northern countries of

Europe, it is less than in Spain, Prussia, Italy, Austria, Switzerland, Russia, and Bavaria. An infant at birth has less probability of living a week than a man of ninety years, and less probability of living a year than a man eighty years of age.

In England the death-rate in infants under one year, among the wealthy classes and among the poor, is respectively as three to eight; there are nearly three times as many deaths among infants, in a given number, among the poor as there are among the rich. In France the proportion is nearly the same. While the average death-rate among this class, for the whole of France, is about 20 per cent., the death-rate among those in comfortable circumstances is about 7.6 per cent., and in some places as low as 5 per cent. M. Bergeron attributes much of the excessive mortality, 70.8 to 90 per cent., in infants under one year, to the vicious systems of artificial nursing that are followed.

The second report is from the pen of M. Bertillon. Its general character will be sufficiently understood when we consider that he bears much the same reputation in France, as a statistician, that William Farr does in England. This special report treats on infant mortality, its modification from special causes—as local, climacteric, and social. It shows that the mortality, after birth, is much greater in the country than in the cities, and that the country is detrimental until they have passed the third month. The mortality, according to locality, is grouped around two great centres: first, around Paris; second, in the valley of the Rhone, between Lyons and Marseilles. Hired nurses are, of themselves, the cause of the excess around Paris, and they contribute much to the excess in other localities; but in the South, the great heat has a great influence.

In the large cities, and especially in Paris, the mortality is undoubtedly greatest, but it is impossible to determine the exact proportion, on account of the number of children that are sent to the country. The influence of the seasons is complex: during the first few weeks after birth, the cold months are most fatal; later, the hot months. The mortality during the first year is, then, very variable, and very easily increased or diminished. The minimum death-rate is under 100 in the 1,000 living, and it certainly should fall below 90, even to 70; but in France it is nearly 200, that is, nearly double or triple what it necessarily ought to be.

He sums up the causes as follows: Faulty nutrition, excessive heat in summer, malarial exhalations in autumn, and severe cold during the first month. This report contains so much that is interesting that we leave it with reluctance.

The third and last report, by M. Marjolin, includes the care of abandoned children, criminal abortion, infanticide, etc.

Baskets placed on an upright post which turned around, called in French *tour*, were, from an early period, placed at the gates of convents and other institutions, in which abandoned children were received. The object of these was to enable the person who deposited the infant to escape without being observed. There is a difference of opinion among the members of the committee regarding the propriety of reëstablishing these *tours*. The report favors a restoration; but MM. Lagneau and Vacher very strongly oppose this recommendation. The committee received the report, and, having heard the objections offered, resolved to leave it an open question for discussion in the congress. M. Marjolin has well presented his side of the question; we will look with interest for the report of the gentlemen who advocate the contrary view. It is a question of the deepest social interest. It is not a question that has been raised by modern philanthropy; it was discussed in the fourth century, and the report cites the opinion of St. Chrysostom that "*the door should be opened to all unfortunates. While we do not judge with severity, nor inquire too closely into the lives of the fallen, we should endeavor to relieve their misfortunes.*"*

As M. Marjolin advocates his opinions evidently on the ground of Christian charity, those who disagree with him will probably defend their position on the ground of philanthropy, political economy, and social science. This question is probably just as interesting and important in New York as it is in Paris, and it is one that will compel our attention at no distant day. The Commission placed this question of infant mortality first on the list because, no doubt, they deemed it the most important. The remaining five will be noticed hereafter. T. P. C.

The Source of Muscular Power† is a reiteration and strengthened recital of original research and experiment in controversion of the theory that the muscular system accomplishes its work like a machine—by the consumption of food, rather than at

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* M. Villemain, "Eloquence Chrétienne au Premier Siècle."

† The Source of Muscular Power: Arguments and Conclusions drawn from Observations upon the Human Subject under Conditions of Rest and of Muscular Exercise. By Austin Flint, Jr., M.D., Professor of Physiology and Physiological Anatomy in Bellevue Hospital Medical College, New York; Fellow of the New York Academy of Medicine; Member of the Medical Society of the County of New York; Correspondent of the Academy of Natural Sciences, Philadelphia, etc., etc. New York: D. Appleton & Company.

the expense of its own substance—replaced by tissue-making food. The former of these theories is the one taught by Pavy and most other physiologists. The latter, first asserted by Liebig, was explicitly avowed and illustrated by Prof. Flint eight years ago in the case of the pedestrian Weston.* The present essay is a repetition, with corrections, of a paper contributed to the *Journal of Anatomy and Physiology*, October, 1877. It is characterized by that force of original research and logical induction common to the author, and is sure to attract the deserved attention of physiologists.

Pneumo Dynamics† is the title of a deeply interesting and instructive essay on the physical phenomena of pleuritic effusions, based on a series of careful experiments. The author, after carefully describing his experiments, and the results obtained by the use of models, proceeds to demonstrate the fact on which he lays the greatest stress—that an effusion does not push the lung before it, but that the lung, by virtue of its elasticity and retractility, acts as the piston of a pump, and supports the entire body of the effusion, together with the diaphragm; and maintains this condition until the retractile power of the lung is exhausted. Only then can there be either depression of the diaphragm or obliteration of the intercostal spaces.

The essay consists almost wholly of original work, based upon a thorough knowledge of the anatomy of the parts discussed, and the relation of pathological changes—as demonstrated by original experiments—to a correct physical diagnosis. It is a work eminently creditable to the author as an original worker, and of much practical utility to all physicians.

The Golden Rule—not that excellent maxim so often quoted and so seldom followed, but a certain paper called by that name—is thus taken to task by the *Church Union:*

"We find the following in a Boston daily paper, credited to the *Golden Rule:*

"MOTHERS AS DOCTORS.

"Practical mothers learn much by their experience with the little bodies entrusted to their care. Some of the most common-sense facts in the physical culture of these little ones known to the more experienced mothers may not come amiss to those who have had but little care of children. The foundation must be well laid to insure healthy and happy children. The child must be well slept, well aired, well fed, and well bathed. By a thorough understanding and practice of these four simple rules, much of the physical,

* *New York Medical Journal*, October, 1870.

† Pneumo-Dynamics. By G. M. Garland, M.D., Assistant in Physiology, Medical Department, Harvard University. New York: Hurd & Houghton.

mental, and moral suffering in life would be avoided by parent as well as child. If a healthy child (and a delicate one proportionately) is regularly put to bed about dark, in a quiet, well-ventilated, or even cold room, after a supper of plain food, it will naturally awake at daybreak, good-natured, with a keen appetite for a wholesome breakfast. Nutritious, plain food at regular hours, with no candy or stimulants, and free bathing, help the system to ward off many prevalent children's ailments, and to bear with much less danger the few that must necessarily come to the majority of little ones. The child that is just given a little confectionary or any unsuitable food, and then rocked to sleep, should cause no surprise at waking peevish and feverish. It is simply the result of imaginary affection and want of knowledge on the part of the one in charge. It will certainly pay in the end to search diligently the cause when a little child is proverbially cross.—*Golden Rule.*

"Now, the *Golden Rule* is a very able paper published at the centre of sublunary things, and we are glad that it was wise enough to see the truth of this little paragraph, and that in due time the other Boston paper was wise enough to see the same. But we doubt whether even the *Golden Rule* knew its truth by the same personal experience out of which *we wrote* the same paragraph for THE CHURCH UNION some months ago.

"If our Boston contemporaries proceed on *this* plan as to giving credit for their articles, what evidence will they have at length to prove that all their best things do not originate in our little office? We, however, being magnanimous, do not yet assert such a reasonable claim."

Moral and Social Science in Public Schools.—The two bills before Congress, to which we referred in our June number, for the promotion of this object in the District of Columbia, provide (1) that it shall be the duty of the school officers to introduce in the daily exercise of each school in their jurisdiction, instruction in the elements of social and moral science, and that teachers shall give short oral lessons daily on such topics as industry, purity, temperance, cleanliness, honesty, truth, justice, politeness, etc.

(2) School officers shall introduce and sustain industrial expositions of the pupils' handiwork, of all kinds of useful articles made or invented by the pupils, in connection with each public school, and shall be taught and encouraged to explain the purpose of their devices and inventions. We believe such studies and exercises would be eminently proper, and we should be glad to see them instituted.

Physics of the Infectious Diseases* is the title of a handsome little volume giving the observations and cogitations of the author on a four years' residence on the West coast of South America. About half the volume is taken up with a consideration of the habits of the people; the geology, climate, and earthquakes of the region; and upon some of these matters the author indulges his fancy to such a degree that the reader is sometimes in doubt whether he is reading about the causes of disease or the opinions of a speculative philosopher. But the indulgence of fancy in new fields is often the surest means of a clear comprehension of the landscape. Patience in this case is awarded by some new thoughts full of practical suggestion. Conditions are never lost sight of by the true sanitarian, wherever he may be; and to expect to appreciate the causes of disease without an understanding of the conditions under which diseases exist would be folly. Upon this assumption the author of the work under consideration has summarized a large amount of useful information gained by his residence on the South American Pacific coast, placed it face to face with the just now contagious germ theory, and concludes that the inference that infectious diseases are caused by bacterial germs is not a fair one. From this he proceeds to a consideration of the hypotheses of contagious bioplast, infectious molecules, etc., and the therapeutics of infectious diseases—sanitary measures; and to all who are interested in the application of these, as well as to all those who are interested in the germ theory, this book is commended.

"House Air"† is one of the most important subjects which should engage the attention of all physicians not only, but of all civilized people. Uncivilized people—those who have not attained to such a degree of human progress as to provide for themselves houses—and that portion of civilized people who have from time to time, from custom or necessity, lived much out of doors or under tents, are particularly noted for their exemption from pulmonary diseases and scrofula. The essay which invites these remarks is commendable for the conciseness with which the author sums up much that has been written, besides his own extended observations on the importance of sufficiency of pure air under all circumstances, and of the special benefit of out-door treatment of some diseases. Night

*The Physics of the Infectious Diseases, by C. A. Logan, A.M., M.D. 12mo, cloth, pp. 212. Price $1.50. Chicago: Jansen, McClurg & Co.

†House Air, the Cause and Promoter of Disease. By Frank Donaldson, M.D., Professor of Physiology and Hygiene, Clinical Professor of the Diseases of the Chest, etc., University of Maryland. Reprint from Maryland State Board of Health Report, 1878.

air and artificial lighting, which is the common cause of its unhealthfulness, are mentioned with considerable emphasis; but this portion of the subject might have been elaborated with increased benefit. The vitiating effect of burning gas, oil, or candles in nurseries and sleeping rooms for several hours before retiring at night is probably one of the most fruitful of all sources of disease to civilized households.

The Independent has recently set an example eminently worth following by the religious press generally. Under the head "**Sanitary**" appears weekly an article, selected or otherwise, on some subject connected with the preservation of health. Meanwhile quackery in the form of advertisement has wellnigh disappeared from its columns. Godliness and filth are wholly incompatible with one another, and *the* filth of some of the so-called religious press, under the form of advertisement, shows such papers to be unworthy of the names they bear; they are simply promoters of corruption and vice under the guise of religion, and should fall under the bans for the suppression of obscene literature.

Minerals, Natural History Specimens, Scientific and Medical Books advertised by Professor A. E. Foote, should not fail to attract attention at this season of the year, when schools should be furnishing their cabinets and students their libraries. Dr. Foote's diligence as a collector for several years has given him a great advantage over others of more recent growth, and both professors and students will find it greatly to their advantage to consult his catalogue before purchasing elsewhere; his collection of medical books especially, many of which are standard, are offered at considerable less than publishers' prices.

Dr. W. E. Germer, the ever-watchful Health Officer of Erie, Pa., will please accept the thanks of THE SANITARIAN for recent papers from Vienna and Capetown, containing important contributions to vital statistics.

New Journals Received.—*Boletin de Médicina Naval.* Periodico oficial del cuerpo de Sanidad de la Marina. Director: Dr. D. José de Erastarbe, Sub-Inspector de Segunda Clase, etc., etc. Tomo 1, Num. 1 y 2, Enero y Febrero de 1878. San Fernando: Establecimiento Tipográfico de Don José Gay, Impresor de Cámara de S. M., 1878.

Revista Médica de Chile. Publicada bajo la direccion de la Sociedad Medica. Año vi., Num. 7. Enero 15 de 1878. Santiago de Chile: Imprenta de "La Estralla de Chile," 19 J—— Augustinas, 1878.

La Salud. Semanario popular de intereses vitales, ilustrado con

grabados, siempre que el caso lo requiera. Director-Propietario, José de Letamendi, Doctor en Medicina, Catedratico de Anatomia de esta Facultad, etc. Barcelona: Imprenta del Heredero de D. Pablo Riera, calle de Robador, número 24 y 26.

Gaceta Médica de Cataluña. Año 1, Núm. 1 y 7. Enero á Marzo. Redactores: Dr. Bataller Constant y muchos otros Medicos y Profesores. Redaccion: Plateria, 11, 2°. Administracion: Ronda de San Antonia, 64, 1°. Barcelona: Establecimiento Tipográfico de Narcisco Ramirez y C°., pasaje de Escudillers, Número 4. 1878.

La Pampa Médica. Revista Mensual, consagrada especialmente a las Ciencias Médicas y accesariamente á la Farmacia. Se publica el 5 de cada mes. Redactor-Gerente: Dr. C. Lesbini. Redaccion y Adminestracion: Plaza Principal No. 3. Cordoba, Republica Argentina, America del sur: Establecimiento Tipografico Rivas, Calle San Geránomo, 50. Enery 5 de 1878. Año 1, Num. 1.

Recueil de Médecine Vétérinaire. Journal cansacré à l'étude et aux progrès de la Médecine Vétérinaire des Sciences qui s'y rattachent et aux intérêts professionnels, paraissant le 15 et le 30 de chaque mois, et publié sous la direction de M. H. Bouley, membre de l'Institut et de l'Académie de Médecine, etc., etc. Avec le concours d'un gran nombre de Vétérinaires praticiens français. vi° Série. Tome v., No. 4. 28 Février, 1878.

Le Recueil de Médecine Vétérinaire contient *in extenso* le Bulletin des séances de la Société centrale de Médecine Vétérinaire. On s'abonne à Paris, au Bureau du Journal, chez P. Asselin, libraire de la Faculté de Médecine et de la Société Centrale de Médecine Vétérinaire, Place de l'École-de-Médecine.

Advent Tidende, et maanedligt Tidsskrift bestemt til Kristelig Religion, Profetiernes Förklaring, og Budskabet om Kristi andet Komme. April, 1878. Trykt af Det Syvende-Dags Advent Trykkeri Selskab. Battle Creek, Michigan. Pris $1.00 om Aaret. Enkelt Nummer, 10 cts.

Svensk Advent Härold, en Månadtlig Tidskrift invigd til Praktisk Kristendom, Profetiornas Förklaring, och Forkunande af Kristi Ankomst. April, 1878. Tryckt af Sjunde-Dags Advent Tryckeri Föreningen. Battle Creek, Michigan. Pris, $1.00 for Aaret. Lösnummer, 10 cts.

La Gaceta Cientifica de Venezuela, Revista hebdomadaria de las Ciencias y sus aplicaciones practicas. Redactor propietario: M. M. Ponte, Doctor Médico. Caracas, Venezuela: Imprenta a Vapor de "La Opinion Nacional."

Books and Pamphlets Received.—Fownes' Elementary Chemistry; Maclagan's Germ Theory of Disease; Transactions of Medical Association of Georgia, 1878; Sims' Cholecystotomy for the Removal of Gall Stones; Everett's Faradic Treatment of the Uterine Fibroids; Hatch's Report on Public Hygiene and State Medicine; Kedzie's Healthy Homes for Farmers; Compton's Medicine, Present and Future; Garrigue's Lying-in Institutions; Chadwick's Functions of the Anal Sphincters, so called; Love on the Soft Palate; Hartman's Intra-Laryngeal Growths; Duhring's Atlas of Skin Diseases, Part IV.; Noyes' Report on the Health of Children, Oneida Community; Evans & Co.'s American College Directory.

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SUNLIGHT AND SOLARIZATION IN HEALTH AND DISEASE.

By E. C. Angell, M.D.

According to Plutarch, when the youthful Alexander visited Diogenes at Corinth, he found the famous cynic tranquilly lying in the sun. The warrior affably saluted the philosopher, and asked if he could do him any service.

"Only stand a little out of my sunshine," replied Diogenes. This incident occurred when this renowned Athenian had reached the age of "three-score and ten"—long past the eccentric days of his life in a tub and his daylight lantern searches for an honest man; and there is good reason to suppose that he really valued the invigorating solar rays more than any boon Alexander could give. Nor was he alone in his devotion to sunshine, for, as we learn from Pliny, it was a common practice in Greece for old men to recruit their energies, both mental and physical, by exposing themselves naked in the sun—a fact which Hippocrates might have had in mind when he wrote: "Old men are double their age in winter, and younger in summer."

Among the Romans, the two Plinys accustomed themselves quite as much to sunshine as did the sensible and shrewd Diogenes. Pliny the elder, a man of acuteness and extraordinary intelligence, would employ his leisure after dinner in summer lying in the sun. His nephew, the younger Pliny, who relates this fact, had himself, at both his country seats, gardens bordered with thick hedges, where he could walk completely nude, thus immersing his whole body in the solar blaze. In fact, the love of sunshine was a marked feature of old Roman life, the dwellings being generally provided on the roofs or southern walls with balconies or terraces, termed *solaria*, where the occupants, sitting or reclining, could sun themselves at their ease.

This use of light and heat was rather prophylactic than remedial. The therapeutic efficacy of sunshine, however, was by no means unknown to the ancients.

Gorræus, as cited in Main's "Expository Lexicon," published in London in 1860, says that *heliosis*, or exposure to the rays of the sun, was a remedy among the ancient physicians for many affections

of the body, and he mentions particularly dropsy, inflammation of the kidneys, and paralysis.

Hippocrates, in prescribing for a fever with chills, directs that the patient warm himself in the sun. Aurelianus and Celsus also refer incidentally to the advantages of sunshine, the latter recommending, for those of weak digestion, a house "well lighted, having the winter sun"; and he further observes that for patients of this class, exercise in the sun, if the head can bear it, is better than exercise in the shade. It should be noted also that Celsus warns these same dyspeptics against the "meridian sun," and that both he and Galen comment on the evils that may result from excessive insolation, or exposure to the solar rays.

To come to more modern times. In 1815 Jean François Cauvin presented to the Faculty of Medicine at Paris, of which Dupuytren and Pinel were then members, a thesis on the benefits of insolation.

The effects of sunlight on animal life were also discussed by J. C. Ebermier, E. P. Girard, E. Horay, and others, prior to 1820.

In 1837 we find Dresig putting forth, at Leipsic, a latin dissertation, entitled "Solication; or, the Insolation of the Ancients," and ten years later, at Gottingen, Richter gave the medical world another dissertation in the same language on "Insolation; or, the Power of the Sun on the Human Body."

Since then curious and interesting experiments and observations have been made by Becklard, Becquerel, Draper, Edwards, Gardner, Hunt, Landgrebe, and others, and yet a learned French authority, in the "Encyclopedic Dictionary of Medical Sciences," in process of publication, speaking of the action of light upon the animal organism, frankly says: "We do not know, in short, what is the exact effect produced by light. Does it act directly, or is its only effect to modify the intensity of certain functions, such as respiration? this is what we do not know."

So much for our solar scientific physiological knowledge, or rather ignorance. As to the practical therapeutics of the case, there has been, perhaps, until very recently, no real scientific advancement since Dr. Jonathan Perreira, of London, completed, in 1848, the revision of his admirable "Elements of Materia Medica and Therapeutics," in which he recognizes both solar light and solar heat among the "physical, but imponderable," remedies. Of solar light he remarks that it acts as a "vivifying and vital stimulus," promoting "development and nutrition," and he further says: "In maladies characterized by imperfect nutrition and sanguification, as scrofula, rickets, and anæmia, and in weakly subjects with œdematous limbs, free exposure to solar light is sometimes attended with the happiest results."

As to solar heat, after observing that the ancients were well acquainted with its "salutary influence" on the human system, and frequently made therapeutic use of it, he adds: "Exposure to the solar rays, or, as it is termed, insolation, may be employed as a stimulant to promote circulation and warmth in the old, debilitated, and paralytic." "It is also valuable in anæmia and scrofula, and as a restorative after lingering and painful maladies."

It is not necessary to quote further at this point to establish the

fact that sunshine has been for upwards of two thousand years a therapeutic agent of acknowledged efficacy and value. Nevertheless, it remains indisputable, incredible as it may seem, that so far as this remedy is concerned, we are still on the threshold as regards both practical and scientific knowledge. The reason of this is not far to seek. In exhibiting the solar ray the medical practitioner deals with an agent of dangerous potency, of unusual elusiveness, and of great complexity. All physicians are more or less familiar with sunburn, and not a few are acquainted with sunstroke, and none need be told that the sunbeam has power like a swift poison to reach with disastrous effect the very seat of life, as well as to work various minor physical evils. As to elusiveness, the quantity and quality of sunshine depends so closely on the season and the passing changes of the weather, that it is a matter of doubt whether, on the average, a solar prescription can in our latitude be satisfactorily filled in nature's great pharmacy during more than four hours out of the twenty-four, or more than four months out of the twelve.

And finally, to appreciate the complexity of the agent in question, we have only to recall the fact that the sunbeam is resolvable into rays of various colors, mysteriously embodying in different proportions the two great forces of light and heat, and the third subtle form of energy known as actinism, which is essential to the chemical miracles of photography or solar art, and not improbably may yet be found quite as miraculously potent in heliosis, or solar therapeutics.

It is one of the current facts of popular knowledge that the sun has been, and not without reason, practically deified by the high-priests of modern science as the god of force, the Hercules of the nineteenth century. As the enthusiast, Tyndall, eloquently writes: "There is not a hammer raised, a wheel turned, or a shot thrown that is not raised, turned, or thrown by the sun." And he might have added: There is not a seed quickened, a plant nourished, or an animal perfected that is not nourished, perfected, and vitalized by the sun.

Nevertheless, this system of things is so poised, that like the lightning's flash or the sweep of the tornado, this great power may become a destructive curse, and the seed may shrivel, the plant wither, the animal perish from excess of the very force without which it could not exist. With human beings the trouble generally is that the pernicious effects of an excess of solar light and heat are so sedulously avoided that we err in the opposite direction, and it is quite safe to assert that in civilized countries three persons out of every four are suffering more or less from insufficient solarization—which convenient term may be employed to denote the total beneficent action of the sun's rays on the human system.

Heat, whether hygienically or therapeutically considered, is an agent of great efficacy and value; nevertheless the profession at large do not look upon solar heat, individually considered, as particularly worth special attention, for the reason that its chief benefits seem equally derivable from artificial heat, which is generally much more readily obtained, and because it is this element of caloric

which is often injurious to the very person most in need of the salutary influence of the sun.

It is, in fact, one of the great problems in solar therapeutics to so regulate the thermic force as to avoid annoyance or injury from its effects upon delicate constitutions, while receiving the full benefit of the luminous, and particularly of the actinic, element in the sunbeams. These elements are of the utmost importance, and, so far as their beneficial effects upon the human organism are concerned, they are practically unobtainable from any artificial source.

It should be observed here that in this discussion I am leaving out of the question entirely the relations of light to the eye as an organ of special sense, and also the use of solar heat by means of burning glasses for cauterization and other processes pertaining to surgery more properly than to therapeutics. The question I wish to press home to the conscientious and intelligent medical practitioner is simply this: Do my patients receive enough of the peculiar vitalizing influence which is lodged in the solar rays, and if not, how can it be most easily and safely administered?

There is no doubt that many physicians who are quite ready, in theory, to admit that sunshine is a valuable remedy, are, in practice, deterred from resorting to it through apprehension of some of the undesirable and often serious evils which in ordinary life it too often occasions. The annoying cutaneous eruptions or irritations resulting from excessive insolation, the hepatic disorders and general debility caused by prolonged residence under tropical skies, the sudden fatality or lingering blight of sunstroke, all serve to prejudice them against the remedial use of the solar rays. They observe almost daily, during the hot season, various minor disturbances produced by exposure to a blazing sun; they read perhaps in Dr. Wood's monograph on sunstroke of the celerity with which he killed rabbits by submitting them in closed boxes to the sun's action; they find Esquirol and other celebrated alienists tracing causes of insanity directly to insolation; and they resolve to have as little as possible to do with so dangerous an agent, preferring to view it solely from a pathologic and not at all from a therapeutic point of view. Such a course, however, is very far from wise. As soon should the physician think of banishing opium from the *materia medica* because of the deaths for which laudanum is responsible, and the long train of miseries arising from the opium habit. He simply prescribes it with increased care, and taxes his inventive powers in contriving means to secure its benefits and avoid as much as possible its deleterious effects. Precisely this policy should be pursued with reference to the rays of the sun, and the observer in this direction may inspire himself with the thought that if he or his patient should chance to acquire the "sunshine habit," it will prove as advantageous as the opium habit is destructive.

The therapeutic use of the solar rays practically resolves itself into a question of the exhibition of sunlight in such a way as to eliminate any objectionable excess of heat and light, and to secure as much as possible of the actinic force.

As to the general beneficial effects of sunlight, and the injurious

consequences that result from any prolonged deprivation of it, there is abundant testimony, to say nothing of the evidence furnished to every man of experience by personal observation.

Dr. Forbes Winslow, in his suggestive volume on "Light, its Influences on Life and Health," thus summarizes the pathological effects of a marked deprivation of solar light: "It may be enunciated as an indisputable fact that all who live and pursue their calling in situations where the minimum of light is permitted to penetrate suffer seriously in bodily and mental health. These pathological phenomena are principally observed among those confined in dark mines and collieries, holds of ships, factories, prisons, narrow streets, garrets, or cellars. The total exclusion of the sun's beams induces an impoverished state of the blood, muscular debility, dropsical effusion, softening of the bones, nervous excitability, irritability of the heart, loss of appetite, consumption, physical deformity, stunted growth, mental impairment, premature old age. The offspring of those so unhappily trained are often deformed, weak, and puny, and are disposed to scrofulous affections."

This is a formidable catalogue of ills, but the facts are confirmed by investigations carefully made as to the health of the miners in Belgium and other European countries. It was shown thereby, for instance, that in the arrondissement of Chémay, where part of the inhabitants are employed in the fields and the rest in the coal-mines, the field laborers readily furnish their proper quota of military recruits, while among the miners it is rare to find a man who is not ineligible from army duty through arrested physical development or positive deformity.

It is true that these morbid conditions may be largely ameliorated or entirely removed by a free and constant exposure to light, especially if the remedy is applied while the sufferer is still young.

Fourcault, in his "General Causes of Chronic Maladies," gives a striking illustration of this in the case of a number of orphan girls suffering from chronic diseases, whose condition was greatly changed for the better by simply doing away with the shade of several large mulberry-trees, which had prevented the free exposure of their school-room to the full light of the sun.

In commenting on the inestimable value of sunlight to children, Dr. Winslow says: "It is systematically ignored at the period of life when it is of the highest importance it should be brought to bear upon the purification of the blood, and consequent healthy development of organic structures. Children, even at an early age, should not be excluded, particularly during the warm periods of the year, from the genial and charming influences of the sun. Great benefit," he further says, "would accrue from giving children solar air baths—that is, permitting them to lie naked upon the bed or floor, free from the encumbrance of clothes, so that their bodies may be thoroughly brought under the influence of good air and bright sunlight. The children of savages, as well as negroes, who are often allowed to run about in the open air, freely exposed to the influence of the light, have finally developed muscular structures, and generally enjoy robust health."

The testimony of Alexander von Humboldt affords additional

confirmation of this fact: "Deformities and deviations from healthy physical development are exceedingly rare in certain races of men, especially those who have the skin strongly colored, and who wander about naked under the brilliant light of the tropical regions. These have muscular, fleshy bodies, rounded contours, and present none of the deformities so frequently observed among the inhabitants of other climates."

No one who has remained long at Constantinople can have failed to observe the strong, ruddy appearance of the *hammals*, or porters, who are also the firemen of the Turkish metropolis. These men wear nothing above the belt during the summer season, and I have certainly never seen elsewhere so many model athletic forms as are gathered together by an alarm of fire at this gem of the Orient. Much advantage is no doubt derived by our oarsmen from the practice of rowing stripped to the waist, thus exposing a considerable surface of the body to the invigorating action of the sun as well as the wind.

A curious confirmation of the value of light in the development of the growing animal organism was afforded by the experiments of Dr. W. F. Edwards, made something more than fifty years ago in France. He found that the development of frogs' eggs was almost completely prevented by placing them in darkness, and that even a tadpole kept in a dark place, though it attained an unusual size, did not change its form; a result since verified by Dr. Hammond, who found that while the transformation was delayed for an indefinitely long time by confinement in darkness, the creature became a frog in a few days when supplied with light.

Among the disadvantages of deficient sunlight may be noted an increased susceptibility to contagious diseases. Sir David Brewster observes that in cholera years it was invariably found that the deaths were more numerous in narrow streets and northern exposures, where the salutary beams of light and actinism had seldom shed their beneficent influences.

In view of the deplorable effects of the deprivation of sunlight upon the normally healthy, the consequences of a like privation in the case of the sick may reasonably be supposed to be very serious. On this point Dr. Hammond says, in his treatise on hygiene: "I shall never forget the appearance presented by the sick of a regiment I inspected in Western Virginia. They were crowded into a small room, from which the light was shut out by blinds of india-rubber cloth. Pale and exsanguined, ghost-like looking forms, they seemed to be scarcely mortal. Convalescence was almost impossible, and doubtless many of them died who, had they been subject to the operations of the simplest laws of nature, would have recovered." In the same treatise Dr. Hammond further says: "In chlorosis, scrofula, phthisis, and in general every disease characterized by deficiency of vital power, light should not be debarred the patient. In convalescence from almost all diseases it acts, unless too intense or too long continued, as a most healthful stimulus both to the nervous and physical systems. The evil effects of keeping such invalids in obscurity are frequently very decidedly shown, and cannot be too carefully guarded against by the physician. The deli-

rium and weakness which are by no means seldom met with in convalescents kept in darkness, disappear like magic when the rays of the sun are allowed to enter the chamber. I think I have noticed that wounds heal with greater rapidity when the light is allowed to reach them than when they are kept continually covered."

A further illustration of the value of solarization in surgical cases is furnished by a case reported by Dr. Stephen Smith, as treated at Bellevue Hospital: "A young man, suffering from disease of the ankle-joint and of the tarsal bones, was admitted, in the month of June, so enfeebled that it was decided that he could not survive amputation. His symptoms were those of septisemia. The weather was very warm, the patient was very weak and very much emaciated, his skin pale and bathed in cold perspiration, his ankle the seat of profuse suppuration. I directed that his entire body be exposed to the sun each day. He began to improve immediately, the sweating ceased, the skin became bronzed and firm, his general condition changed for the better, and the local disease began to improve. He was soon well enough to have excision of the diseased bones, gained a useful limb, and, I have no doubt, owes his life to insolation."

The famous Florence Nightingale ranks light as second only in importance to the sick to fresh air, and says, in her "Notes on Hospitals": "Direct sunlight, not only daylight, is necessary for speedy recovery, except perhaps in certain ophthalmic and a small number of other cases. Instances could be given, almost endless, where, in dark wards or in wards with northern aspects, even when thoroughly warmed, or in wards with borrowed light, even when thoroughly ventilated, the sick could not by any means be made speedily to recover. Window blinds can always moderate the light of a light ward, but the gloom of dark wards is irremediable. We can generate warmth; we cannot generate daylight or the purifying effects of the sun's rays."

Further testimony as to the therapeutic value of sunlight is borne by the "Dictionary of Materia Medica" of Murat and De Lens, which says: "We cannot doubt that the influence of light is one of the conditions most indispensable to health, and that it may consequently be usefully employed by the therapeutist. It acts as a powerful excitant of the organism, and particularly of the functions of the skin, in cases of general atony, of chlorosis, of lucophlegmasia, of scurvy; in rickets, in scrofula, in chronic engorgement of the viscera; it is, above all, highly useful in convalescence."

A recent and practical English writer, in A. Winter Blyth's "Dictionary of Hygiene and Public Health," treats this question as follows: "The direct rays of the sun are great remedial and preventive agents in certain diseases, such as scrofula, phthisis, rickets," etc.

Among the records of particular cases, a striking one is furnished by the celebrated Baron Dupuytren. A Parisian lady who had many physicians, none of whom could cope with the complication of diseases which afflicted her, applied to the Baron as a last resort. Being unable to suggest any drug treatment which she had not already tried in vain, he contented himself with directing that she

be removed from the dark street and dismal rooms in which she had been living to a brighter part of the city, and exposed as much as possible to the light. The result of this, as related by Dupuytren, was the rapid improvement and ultimate complete recovery of the patient.

J. F. Cauvin, whose thesis on the benefits of insolation has been already mentioned, cites therein at much length the case of a college classmate, aged twenty-three years, who suffered from a severe attack of acute articular rheumatism. The swelling of the knee and ankle-joint were persistent, defied all treatment, and made the use of his legs impossible. At last insolation was employed, the solar rays being concentrated upon the diseased parts with the gratifying result of an entire recovery.

In another instance he succeeded in removing a poor workman, his wife, and family of eight children from their dark and gloomy quarters in the city, and placing them with a rich farmer in the country, where they were received through charity, and though their food consisted only of brown bread and a little soup each day, he says: "I had the pleasure, at the end of a week, to see the evil changed to good; that is to say, their entire systems, which were wasting away daily, took a turn towards good health, which became more and more evident. It was fortunately the month of April, and the weather was dry. Every day I ordered them to remain in the sun alongside of a wall as long as possible. I made them cleanse their bodies at frequent intervals with warm water and soap in order that they might be better penetrated by the solar rays and the pure air. At the end of a month and a half I saw the disappearance of the numerous affections from which they had suffered. The father had an indolent scrufulous ophtalmia. Despite the acute character which this phlegmasia took at the beginning, I directed him to persist in his work in the open air and sunshine, being careful merely to have him wear an eye-shade of green taffeta. The vital forces regulated by insolation, led to a perfect cure. The scurvy or ulcerous eruptions, with which three of the children were covered, likewise disappeared. Of the younger children, one had an obstinate whooping-cough; in two others the glandular system was scrofulously congested. I made them lie in the sun during several hours each day, and they were perfectly cured."

Cauvin quotes Professor Dubois, one of the faculty at that time, as saying, when some miserable little wretches had been brought by their parents before the class for treatment: "Take these children to the country, feed them as well as you can, but above all roast them—roast them in the sun."

The late David Urquhart, through whose instrumentality Turkish bathing was reëstablished in Western Europe, was also a believer in insolation, and has recorded the case of a woman who was abandoned to die of consumption by her physicians, but whose health was restored by divesting her of tight and dark clothing and making her lie in the sun every hour that he shone. The later years of Mr. Urquhart's life were passed in the Swiss Alps in endeavoring to ameliorate the sufferings incident to insufficient sunshine. It is well known to visitors of those regions that in the deep valleys the

sun shines only a few hours each day, and, as a consequence, the inhabitants suffer terribly from scrofula and other diseases incident to poor nutrition. The women, almost without exception, are deformed by huge goitres, which hang pendulous from their necks unless supported by slings. A considerable portion of the males are idiots. Higher up the sides of the mountains the inhabitants are remarkably hardy, and are well developed mentally and physically. The only difference in the mode of life is in the greater amount of sunshine, and when these poor unfortunates below are carried up the mountains they improve with great rapidity.

The beneficial effects of sunshine are remarkably illustrated in the experience of Dr. Warren, as recorded by himself in *Public Opinion* of August 8th, 1863. He says: "Seclusion from sunshine is one of the misfortunes of our civilized life. The same causes which make the potato vines white and sickly when grown in dark cellars, operate to produce the pale, sickly girls that are reared in our parlors. Expose either to the direct rays of the sun and they begin to show color, health, and strength. One of the ablest lawyers in our country, a victim of long and hard brain labor, came to me, a year ago, suffering with partial paralysis. The right leg and hip were reduced in size, with constant pain in the loins. He was obliged, in coming upstairs, to raise the left foot first on every stair, dragging the right one after it. Pale, feeble, miserable, he told me he had been failing several years, and closed with, 'My work is done. At sixty I find myself worn out.' I directed him to lie down under a large window, and to allow the sun to fall upon every part of his body—at first ten minutes a day, increasing the time until he could expose himself to the direct rays of the sun a full hour. His habits were not essentially altered in any other particular. In six months he came running upstairs like a vigorous man of forty, and declared, with sparkling eyes, 'I have twenty years more of work in me.' I have assisted many dyspeptics, neuralgic, rheumatic, and hypochondriacal people into health by the sun cure. I have so many facts illustrating the wonderful power of the sun's direct rays in curing certain classes of invalids, that I have seriously thought of publishing a work to be denominated the 'Sun Cure.'"

Dr. Hammond, in a paper published in the first volume of THE SANITARIAN, arrives at the following conclusions: "Care should be taken both in health and disease to ensure a sufficient amount of light, and it is impossible to rear well-formed, strong, and robust children unless attention is paid to this requirement. Sun baths, or apartments in which the solar rays can fall upon the naked body, are highly advantageous to health, and rooms for this purpose could easily be constructed in most of our city houses. Let us then, to use the dying words of Humboldt, have 'mehr licht.'"

Dr. Emmet strongly advocates sunshine, and observes that the tonic advantages of iron are greatly augmented by direct exposure of the body to the solar rays.

Dr. J. H. Kellogg, in a suggestive volume on health, recently published, says: "Sunlight surpasses all other agents in restoring color to the blanched and ghost-like faces of long-housed invalids, and sun-baths, rightly used, are powerful remedies for disease."

Among the attractive features of that excellent edifice, the New

York Hospital, is its *solarium*, situated on the top of a portion of the structure, and enclosed in glass, serving also the purpose of a conservatory. Here, in sunny days, are congregated many patients, and they certainly have the appearance of being very comfortable. The great Hospital of St. John, at Brussels, has on the roof an elegant garden, tastefully laid off, and planted with shrubs, small trees, and a grass lawn, interspersed with fragrant flowers. In this quiet rural retreat, patients, particularly convalescents, are permitted at certain hours of the day to promenade, indulging in the luxury of good air and bright sunlight. There are few of our hospitals that might not profitably imitate these examples, and not only construct rooms enclosed with glass, but, better still, rooms without glass, where direct solarization can be employed with the most gratifying and salutary results.

My own personal observation of the efficacious results of the therapeutic use of the solar rays extends over a period of fully twelve years, and embraces a considerable variety of diseased conditions, for the most part chronic. I will cite a few in which I think the very marked benefits produced were directly due to insolation.

A most persistent case of acne, which covered the face, chest, back, and shoulders, and which for many months resisted all hygienic and remedial measures, was effectually and speedily cured by exposure to the solar rays, the general diminution of the eruption being observable from the very beginning of the treatment. I have since employed this agent in several obstinate cases of this annoying and unsightly affection, and in every instance the eruption has been speedily dispelled, while every case has been immeasurably improved in general condition and tone. A case of chronic eczema of the most stubborn type yielded completely to the potent influence of the sun after three exposures of one hour each to its healing rays.

In dyspeptic conditions I have observed the very best results from frequent and prolonged insolation. I recall in particular the case of a young Englishman who had been a great sufferer from dyspepsia, and had derived only limited benefit from a long continued course of general treatment, but who speedily acquired, by regular exposure to the sun, the health, development, and vigor of an accomplished athlete. Another Englishman, who had been steadily losing strength and weight, in spite of various remedial measures—his trouble being in part mental—gained ten pounds in three weeks by daily insolation, and remained heavier and stronger for the next twelve months.

Still another case of dyspepsia, with much emaciation, gained twenty pounds in six weeks by the same treatment. In regard to increase of weight, it should be observed that the first effect of insolation is to reduce weight, as a stout person accustomed to solarization may lose two, four, six, and even ten pounds in a single prolonged exposure, and gain correspondingly in buoyancy and vigor.

A gentleman from the British provinces, suffering from partial dementia or incipient insanity, was so greatly benefited by a course of judicious insolation that in a few weeks his melancholia was completely routed, and he was enabled to return to his friends and business.

A lady of middle age, suffering from chronic bronchial catarrh,

found great improvement from each insolation, and before she had taken twelve this disability was entirely removed; but what surprised her most was the fact that hay fever, from which she had suffered the five years preceding, did not return. The treatment of this case involved on each occasion one hour under colored glass and a half hour of direct insolation, accompanied with anointing of the entire cutaneous surface.

It is hardly essential to cite further authorities or cases to prove the feasibility and value of the therapeutic employment of the sun's rays. Something should be said, however, of the curious development of solar therapeutics which has taken place outside the profession as a result of what is known as the "blue glass theory." Setting aside the effect on the patient's imagination, which is often a potent element in new remedies, if not in old ones, whatever good may have been accomplished by the use of blue glass as a remedial agent is of course due to the solar rays. And we can well afford to pass without criticism the questionable facts, and still more questionable philosophy, of the military gentleman who originated the blue glass mania, in view of the good service he has done in turning the attention of the public and the profession to the real value of sunshine.

All the talk, however, about blue light and red light has raised a crowd of questions of more apparent than real importance. As every one knows, the pure white light of the sun is resolved by the prism into rays of seven distinct colors, namely, violet, indigo, blue, green, yellow, orange, and red. It is agreed, furthermore, among scientific men, that what we call heat is most marked upon the red side of this spectrum, actinism is most powerful upon the opposite or violet side, and light is strongest next the heat, that is, in the orange and yellow rays. Besides these there are invisible heat rays beyond the red, and invisible actinic rays far beyond the violet. Again it is established beyond doubt that the rays of different colors exercise very different effects upon animal and vegetable life.

Becklard found, for instance, that flies' eggs were readily hatched under different colored glasses, but that subsequent development was much the greater under blue or violet glass. Dr. D. P. Gardner made, in Virginia, in 1843, a series of experiments, not with colored glasses but with the colored rays actually separated by a prism, and he found that the yellow ray was much the most potent in producing the green coloring matter of plants, while the violet ray is the principal attraction by virtue of which plants turn towards the light. R. Hunt, who experimented about the same time with colored glasses and solutions, found vegetation most vigorous under the blue. This kind of investigation has greatly excited the amateur solar therapeutists. The champions of blue light and red light are already in the field with rival volumes, and it is not unreasonable to look next for some one "wearing of the green" in a remedial fashion.

I am pretty thoroughly convinced, however, that these subtleties, while worth testing from motives of scientific curiosity, are not likely to prove of any very essential therapeutic value. Nevertheless, blue glass may serve a very useful purpose. It is often desira-

ble and sometimes necessary, in the case of those unaccustomed to direct sunshine, to cut off a part of the heat, and perhaps a part of the light, while retaining as much as possible of the actinic rays. There is probably no better means of accomplishing this than by the employment of a screen of blue glass, which arrests a considerable portion of the heat and light, while retaining in nearly normal force the actinic rays, as shown by the experiments of Becquerel in 1839.

It has been asserted that blue glass increases heat, but the claim is not well founded, as the darker the glass the more it absorbs heat and light, and the more it diminishes both. This is shown in heat by Crook's radiometer, which, under white glass, gives in the sun one hundred and seventy revolutions; interpose blue glass and the revolutions diminish to sixty.

The same useful purpose served by blue glass goggles in case of weak eyes may be served by blue glass screens in case of bodies too weak to bear a free exposure to the solar rays. And as it is desirable to dispense with such goggles as soon as practicable, it is equally desirable to lay aside the blue glass screen, and submit the patient as soon as may be to the full force of the sunshine.

I have found it almost impossible for sensitive patients, suffering from nervous affections, to remain long enough under white glass, or without glass, to be in any material sense benefited from the intensity of both light and heat. Under blue glass, however, both are so modified that the same persons may remain almost indefinitely with pleasure and profit, and I am fully satisfied, after a considerable experience with this agent, that by its introduction into solar therapeutics the sun's rays may be safely and profitably administered to even the most delicate and nervously susceptible of patients. I might almost say that there is no morbid condition in which sunshine, modified by blue glass, is contra indicated.

Dr. Ponza, an Italian physician, found blue light soothing to the insane; and by violet light, in one instance, a crazy person was in one day cured. In some extreme cases, even behind blue glass, eye shades and thin coverings for the head might be advantageous, as they generally are in direct insolation. To secure the best effect, however, the entire body should be exposed to the light. When the direct rays are employed, a preliminary anointing of the entire surface of the body with some simple unguent is advantageous, especially if the skin is eruptive, inert, or sensitive; and if the exposure is prolonged and the sun in full force, it is generally advisable to repeat the inunction every half hour or oftener.

It is important that the solarium should be well ventilated, and the best results, it will be recalled, are recorded of open-air insolation. Modern costume deprives the body so much of light and air that the skin lacks sensibility as well as tone; and there is not only great advantage to be derived from the sun, but there is often much benefit received from exposure to the wind.

The sun alone reddens, the sun and wind conjoined magnificently bronze, the exposed surface in a manner that the winter months will not efface, while the benefits and strengthening effects are still more lasting. Insolation under glass, however, whether white or colored,

is a bleaching process, in which there is neither burning nor discoloration.

The construction of a *solarium* is very simple. Its situation, in cities should always be at the top of the house, and a high house at that, that it may admit air, light, and sunshine from all sides. The roof should consist of sash and glass—an outer layer of white glass and an inner layer of blue glass—with an air space of an inch or more between. The sides should have double sash as well as double glass, and may be ornamented with varied colors and figures to amuse the eye and please the fancy. This mode of construction will diminish the intensity of the heat in summer and the cold in winter, and practically makes the structure available for every day in the year on which the sun shines.

Leading from the apartment already described should be another, with enclosed sides of lattice, consisting of revolving blinds. This room should be open at the top, and would only be available during the warm season. The use of the blinds are threefold—to screen the inmates, to regulate light and shade, and to temper the winds to the nude tenants.

In conclusion, I will not go quite as far as Voltaire, who advised two dull actors to plant themselves out in the sun for six months; but I will take the liberty to urge an increased attention to solar therapeutics on the part of the medical profession, for the sun's rays may be employed with absolute advantage and with as absolute safety.

Whenever the blood is impoverished and the red corpuscles are few, whenever the vital forces of childhood or age are weak, whenever convalescence is lingeringly slow without obvious cause, plunge the patient into sunshine as strong as it can be borne, and as constantly and as continuously as possible.

In asthma, bronchitis, catarrh, dyspepsia, gout, malaria, or rheumatism, and above all as a means of saving the stout from fatty degeneration, or in many acute, and nearly all chronic maladies, insolation is richly worth repeated trials, and offers fair promises of excellent results.

It was asserted by Father Labat that the savages on the Mississippi used to cure syphilitic cases by the strange treatment of administering two or three violent purges, followed by exposure to the sun all day upon the sand. Dr. Livingston found syphilis unknown in Central Africa, and even after its introduction by visitors from the coast, it met with a spontaneous cure among the natives who remained—their scanty clothing and constant exposure to the sun the supposed probable cause of the cure.

It would be strange enough if strong sunshine should be found to possess power to expel or neutralize a malady that has proved not only exceedingly difficult to cure, but so impossible to quarantine.

Without anticipating medical miracles, the professional practitioner may rely upon deriving from judicious insolation such ruddy complexions, hardened muscles, improved digestion, purified blood, enlivened spirits, and invigorated vital powers, as shall more than justify all I have advanced in defence or praise of solarization.

THE RELATIONS BETWEEN SEWER GAS AND DIPHTHERIA.

Read before the Society of Medical Officers of Health, May 17th, 1878.

By John W. Tripe, M.D.,

Medical Officer of Health to the Hackney District, etc.

When I selected the above title for my brief paper, it was my intention to have referred to various endemics which have from time to time been reported by medical officers of health, but ill health and loss of notes must be my excuse for confining myself almost entirely to a description of and a few remarks on the endemic which lately occurred in my district. I may, however, state as regards endemics that have happened elsewhere that, to the best of my recollection, defects in the means of drainage were found to exist in the houses where the disease first appeared, so that sewer gas escaped into the interior of the houses or into the cisterns, and impregnated the air or water with matter in a state of decomposition, or, it may be, conveyed germs of the disease into the air or water. Those who believe in the specific origin of diphtheria would adopt the latter view, whilst others who consider the infection to be non-specific, or at any rate, of fœcal origin, would assign the outbreak to the former cause.

As I do not propose to lay before you any evidence for or against either of these views, I will merely content myself with pointing out that the objectionable arrangements in the houses at Clapton, to be presently described, were of long standing; and that a few days before, and at the time of the outbreak, very offensive smells were noticed coming from the gulleys (a most unusual occurrence), and therefore we may fairly assume that the sewer gas was at that time charged to a greater or less extent with matters which are usually extraneous to it. One point raised in this case, as to whether or not a large heap of house refuse could cause an attack in persons residing at a distance of more than an eighth of a mile, can be answered in the negative, as I am not aware of any case supporting an affirmative answer, whilst there are almost innumerable ones to the contrary, although the offensive contents of dust-bins immediately below an open window have been supposed to have acted as an exciting cause.

The first notification that I had of the outbreak was contained in a letter which I received concerning some cases at Warwick Road, Clapton; and on making an inspection of the first house in which they occurred, it was found that a direct communication existed between the interior and the sewer. As complaints were also made of most offensive smells from many of the gulleys in Clapton, I asked our surveyor to have them examined, which was done, when

some, close to the house in the Warwick Road, were found to be untrapped. I also had a circular letter sent to every one of the medical practitioners of Upper Clapton and Stamford Hill, asking for information as to the existence of cases of diphtheria, but did not receive any reply whatever, except from one medical firm, who informed me that they had cases in their practice, but did not give any names or addresses, so that I am unable to state the number of cases, except as regards those in the 134 houses visited. The history of the outbreak is as follows: On February 16th, three cases which terminated fatally occurred at Powell Road, Warwick Road, and Clapton Common. Powell Road is more than a mile away, Warwick Road half a mile, and the Clapton Common case about a quarter of a mile from the accumulation of house refuse to which the outbreak was attributed by the inhabitants. The only feature common to the three houses was the state of the drainage arrangements, which were such as would allow sewer gas to enter all the houses. I would also mention that the families residing in these houses did not visit one another. On the 21st another case that terminated fatally occurred at Lea Bridge Road within a short distance of Powell Road. On February 28th another case terminating fatally happened at Clapton Common, and a sixth on March 1st at Warwick Road. It was therefore very evident that the accumulation of house refuse could not have caused the outbreak, and that it must therefore be looked for elsewhere. I therefore directed one of the sanitary inspectors to call at every house in the vicinity which I had not visited, when it was found that, out of 134 houses examined, as many as 120 had good drainage arrangements, whilst in 13 they were so imperfect as to have a direct communication between pipes leading to the drains and the cisterns, or with wash-basins in the house. In another house there was a water-closet opening directly into a passage in the basement which smelt very badly, and was found to be imperfectly trapped. In the 120 houses with good arrangements cases occurred in only one; whilst in the fourteen houses in which defective arrangements were found, this additional information was obtained, viz., that four drained into a different system of sewers. No case occurred in the last-mentioned houses, although they are nearest to the dust accumulation; whilst in the ten having defective arrangements which were connected with the ordinary sewers of Clapton, cases of the disease broke out in all but one. I may mention here that nearly all the Clapton sewage finds its way into the high-level sewer, whilst the four houses above named drain into a sewer which opens into a system of sewers connected with the low-level sewer. I think that it is impossible to have stronger evidence that the infection was conveyed into the houses of the patients by the agency of the sewer gas, but why this gas should have had a peculiar infective power at that particular time shown by the infection simultaneously of persons living a mile apart, I am unable to determine. After this outbreak the mortality declined to about its usual level in the district, and in all subsequent cases the water-supply or drainage arrangements were unsatisfactory; for instance, in one case the air pipe from the closet opened into the cistern, which was covered, and

there was a rush of air through it when the handle of the closet was pulled.

I have also previously met with several cases which occurred in those members of the family who slept in a room near to the open top of an untrapped rain-water pipe, which was connected with the sewer, or of a small rain-water pipe receiving the rain-water from the roof of a bay window, but in some cases I could not ascertain any special cause for the outbreak. Kissing at school and elsewhere amongst children has been suggested as one very probable cause of the spread of this disease. As to the cause of endemics which do not appear to depend so much on personal infection, I have found that only one cause is ordinarily alleged to exist, viz., defective drainage arrangements, by which emanations from fœcal matter can obtain access to the interior of houses. Whenever, therefore, cases occur either sporadically or simultaneously, the outlets of fixed wash-basins, baths, sinks, and especially the overflow pipes from cisterns, should be carefully examined, and the rain-water pipes also, if they enter the drains, instead of terminating as they should do in an open end over a trapped inlet to the drain. There is one great objection to allowing rain-water pipes to be connected with the drains even if trapped (unless the pipe be placed at some distance from any windows), because during continuous dry weather the water in the trap evaporates, and the trap becomes consequently unsealed.

The opinion of nearly all those who have witnessed an endemic of diphtheria is that emanations from fœcal accumulations, from sewers, or from water fouled by sewer-gas, were the exciting cause. Thus, Dr. Bailey, the Medical Officer of Health for Bromley, Kent, expresses his belief that the endemic was induced by bad drainage arrangements. Dr. Railton, the Medical Officer of Health for Wilmington, reported that, in almost every case in his district, nuisances were found, such as waste-pipes passing direct from the nursery to the drains, or ashpits containing offensive refuse which were immediately below the bedroom window. Dr. Russell, Medical Officer of Health for Glasgow, in an address lately published, described diphtheria as a disease originating in, or at any rate dependent on, fœcal matter for its propagation. He does not consider it to be in any way analogous in its mode of spreading to scarlatina or measles. Dr. Russell also remarked the large proportion of cases in Glasgow, as in Clapton, which occurred in better class houses, where a communication existed with the sewers through the waste-pipes of cisterns, baths, sinks, and wash-basins. Dr. Bell, of Glasgow, states that in every house in which he visited patients affected with this disease he found that the drinking-water was drawn from a cistern which was placed above the water-closet and bath-room, and contained slimy green matter which was loaded with minute organisms $\frac{1}{4000}$th of an inch in diameter. He believes that these bodies were the germs from which the disease sprang.

As the result of my own observation I may say that I have not met with the green slime spoken of by Dr. Bell, but will not say that it was absent, although in most instances the water was fairly bright. I believe diphtheria to be infectious, but to a far smaller

extent than scarlet fever, and I have seen cases which possessed all the characters of diphtheria in the same house with others who were apparently suffering from an ordinary sore throat. Some, however, of these slighter cases were undoubtedly true diphtheria, as slight paralytic affections so characteristic of the disease afterwards supervened. I have also been lately informed that albumen will generally be found in the urine of patients suffering from a slight as well as a severe attack of the disease, and that its presence may be looked upon as affording strong evidence that the case is one of true diphtheria.— *The Sanitary Record.*

Graham Flour.—The St. Louis *Trade Journal* in a late issue makes the following sensible remarks about Graham flour:

Because Graham flour is recommended as a very healthy article of food, it should not be assumed that all Graham flour is equally good, or even nutritious. The fact is, Graham flour is rapidly coming to be as much an article of suspicion as ground coffee or spices, or any other of the thousand and one adulterations that are daily practised. The commonest form in which Graham flour is seen is that made from a medium or poor class wheat, and while not properly adulteration, it may be justly characterized as swindling of the meanest kind, for the reason that the product is largely used by dyspeptics, and others in imperfect health. The miller who palms off on his customers Graham flour made from anything save the choicest of wheat is one of the meanest of all villains, and if he is not aware of it, should be told so. Graham flour, properly made, is nearly as costly an article as bolted flour ground from the same wheat, and, therefore, when you are offered Graham at much less than the best bolted flour, you are being victimized—it is either adulterated or it is made from inferior wheat. A common form of adulteration, and one that is practised by at least one retail flour dealer in this city, is to take a barrel of flour costing about $5, add to it about 60 pounds of bran, 25 pounds middlings, and the same quantity of corn meal. The result of the mixture is 306 pounds of stuff costing about $6.45, or a fraction over 2 cents a pound; while Graham flour, made from the best wheat, cannot be sold now at less than 3½ to 4 cents a pound. And yet this vile stuff is being swallowed by people in search of better health, when they would do about as well on a diet of hot white biscuit. There is a fortune in store for the miller here in St. Louis who will make a strictly pure article of Graham flour from the best winter wheat, from which the outer husk of the bran shall have been removed before grinding. That man will establish a good reputation, make money, and confer a blessing upon thousands of his fellows.

INTERVENTION OF PHYSICIANS IN EDUCATION.

A paper read before the Section on State Medicine and Public Hygiene, American Medical Association, at Buffalo, June 6th, 1878.

By E. Seguine, M.D.

Mr. President and Confreres: I said to you last year "new social and individual wants demand new solutions of the problem of education; and most of these expected solutions rest with the physician and physiologist." This implies no personal criticism of our teachers, whom we consider superior to any equal number of women and men anywhere. It is simply the reassertion of a fact concerning the evolution of the idea of education.

According to the object of societies, this idea differs. Now that children are sent to school no more by scores, but *en masse*, imperfections have become apparent in the American public school which did not appear in our old district school—once a model for less advanced nations. Now it is our turn to reform, if we have the least pretension to keep the leadership. But looking only homeward—as children outgrowing their clothes must be supplied with larger ones—so our next curriculum must be enlarged to meet the demand of the American people for ampler development of their destiny.

In this respect, the managers of our school-system have already erred for not perceiving that the present schooling—super-fœtal in some things, barren in others—has, besides many government leeches, turned in stores, and out of the farm or skilled manufacture, more able-bodied drones than it is healthy for a nation to feed in girls' occupations. These managers ought to have understood that educating millions is a different affair from polishing a few privileged; no scholastic or Chesterfield nonsense in the idea of universal education.

But because education was ever before a class monopoly, the present *concept* of "educating in the masses the working aptitudes" had hardly been the object of a thought of the thoughtful. True, Rousseau had declared that each man must have, besides a fair education, a trade, and Prince Albert had given a trade to each of his royal children. But the prince of syllogism and the prince of common-sense were not to the liking of the ruling sharpers of their time; so that it is but recently that the idea that "everybody must be educated to produce enough for his own wants and those of at least a wife and child, or of an aged or crippled relative," lighted up our moral atmosphere like a revelation; as came to our forefathers the ideal of equality, of which our present ideal of the duty of labor for all is but a corollary.

This new social element—as indelible as a baptism—must take the child at his entrance in school, carry him through it, and out of it, stronger, healthier, and better gifted for the enjoyment of his

liberty. That will be the gain of a physiological education; that is what Descartes foresaw when he prophesied that if mankind (as a kind) could be improved, it would be through the progress of medical science. The realization of this prophecy is at hand, since we clearly see the part that the physician will take in their education.

1. During vacation the physician in charge must have supervised the school, seen that everything is clean, and uncleanliness almost impossible; that the grounds be drained in the right direction, and shaded on the proper side; that lights be kind to the eye; that the books, charts, images, and the like be duplicated in several types to suit the different conditions of vision; that the desks fit the progressive ages, and the seats the diversity of shape of the children, particularly of the girls—according to the admirable directions and drawings of Liebreich.

2. Before entering the school the pupils must be scrupulously examined, and their status minutely recorded, as much as possible, in figures, with the metric system and centigrade thermometers, in regard to:

Their general appearance; condition of skin and glands; relations of age to size; relations of size to weight; relations of proportions of parts, or relations of proportions of head to face; relations of proportions of trunk to limbs; conformation and proportions of head; conformation and proportions of mouth; conformation and proportions of ears; conformation and proportions of eyes; conformation and proportions of hands; irregularities of both sides; spinal anomalies (carefully surveyed); breadth and thickness of the chest; circulation; respiration; temperatures—central, local, superficial; possible differences on the two sides.

Remarks on the influence which the above conditions must have on the general and special training of the child, what to avoid, and what to look for him in the school.

3. Before allotting a child to a class-room, in it to one place in relation to the teacher and teaching apparatus, let us consider and note the reach and degree of precision of his sensory organs, and particularly wherefrom will he see and hear best? Otherwise placed, his senses may grow worse; or the erectile tension of their organs, which causes the attention of the mind, being found useless, will slacken, and the desire for learning will die away in proportion to the impairment of the senses, as to the consciousness of the inutility of further efforts. Many educations have failed for this neglect of the physiological conditions of some mode of perceptions. (For the eye, let us be guided by the table-tests of accommodation; and for the ear, follow those of Sapolini, of Milano.) The defects so stated, it is easy to see, from time to time, if they are growing less or worse.

By hygienic cares and a wise progression of acoustic exercises, the hearing may be improved in the school; but for the eye the school conditions are almost fatally adverse. Since there is an incessant demand for the eye to look, mainly in a maze of speck-letters, if the eye was healthy at first, from constant reading it may become sick; and, if already sick, it will grow worse in a progression which has been calculated, and found commensurate to the duration of the

curriculum, and to the intensity of the studies in this wise: "All myopic eyes are diseased," says Donders. In the first year of reading 0.4 of the scholars become myopic; in the second, 4.8; in the third, 8.6; in the seventh, 11.3; in the ninth, 24.1; in the eleventh, 49.5; and the proportion increases also in proportion of the intensity of the studies; according to authorities too competent to be doubted, too numerous to be named.

Would it not be humane in teachers to acknowledge their incapacity to deal alone with this problem, and to require instead of shunning a physiological examination which would indicate what types the children must be given to read, and other cares to be taken at school of their sight? Thus only could be stopped the fearful increase of myopism, which seems to tend to make men the rivals of the fishes of the Kentucky Mammoth cave. Some say it matters little as long as we can only buy spectacles. On this score it would be better yet were we born with this astride-ornament. But myopia, and other eye affections of school origin, are more than physical disease and infirmity; they create most regrettable incapacities, as of exercising many select industries and most of the fine arts. They have also a decided influence on the mode of formation of judgment, which, in short, or otherwise ill-sighted people, is biased by the necessity of looking at things, not as they are, but as they are imagined or liked to be.

Three remedies or prophylactics can be prescribed by the school physician, with the view, if not to cure myopia, at least to stay its progress. One already hinted at is the use of books and other prints whose types must correspond to the visual accommodation; another the supply of an abundant and unique light (the one coming from the left being preferable); the third to transfer most of the studies, exercises, and amusements in the garden-schools, summer-schools, natural history and drawing excursions, in which the eye is invigorated in distant and placid horizons.

At the same time the school physician will have discovered other defects of the senses and of the muscular functions. Among them the difference of contractility, therefore of liability of the two hands, native or resulting from the habit of not using the left when the right works or plays. A habit which secures a ticket for later hemiplegia, unless the school physician makes the children use both hands; and in case the difference is proven extreme or progressive (by dynamometry), he must make the weak side work for two.

An every morning medical survey is expected from the school physician; first, as a quarantine measure against the introduction, in the crowd, of children contaminated by zymotic or contagious diseases, the suspected ones to be kept under observation in regard to the pathological temperatures and other signs which precede the specific symptoms by several days; second, as a means of discovering the simulated diseases as well as the dissimulated ones (the innocent being so crafty), as in the following case just come to my notice: "A ten-year-old school-boy, in Holyoke, Mass., refused to do his writing lesson because he could not lift his arm to the desk, and examination proved that his collar-bone was broken. This had happened two days before, and he had performed all his other duties since, sooner than acknowledge the accident, for fear of being punished."

During the session, and particularly at the changes of season and of temperature, it is important to note the effects of the course of studies on the children. Their mind, which was a blank when they entered the class-room, is no sooner set to work at intellectual or mathematical combinations of facts, ideas, or figures, than the rhythm and number of the pulsations are changed, the heart beats stronger, the blood affluues to the head through the visibly increased calibre of the arteries, the volume of the head is increased too; the general temperature is higher, that of the head considerably so, sometimes that of one side only, or of the base, whilst that of the extremities has cooled. Call it, if you please, an intellectual perturbation, but its action on the physique cannot be overlooked; since its frequent recurrence every day threatens of danger.

In former papers I have quoted the fate of scholars killed by the congestive and combustive processes of thinking. Last fall another was added to the fatal list, the worthy grandson of the physiologist Richerand; and this spring offers in holocaust the poet-laureate of Yale College. The New York Female Normal College has its martyrology too; and I doubt not that our public school has its victims, since I attended quite a number of its children sick from over-work.

At this point the physician must interfere in education. Comparing the present condition of the functions to what they were on entering the school, he sees what alterations have taken place. If there is any, he must study the differences of pulse, respiration, temperature, urea, etc., before and after the morning and evening sessions, and if the differences found justify his interference, he must order the child out; to the garden-school, summer-school, in drawing and natural-history excursions, or, at least, several times a day up to the *solarium*, which can easily be arranged on the flattened roof of the school-house.

Reverting from these hygienic and prophylactic duties to more educational ones the physician will have to create and organize,

5. The physiological training of the senses and of the hand, executers of thoughts; not as a criticism of the intellectual culture, but as its complement.

(*a*) As early as the primary department, the senses are to be trained to perceive phenomena to the utmost of their natural precision, and the hand to execute the dictates of the will with force or delicacy, altogether with the rapidity of conduction of the nerve-apparels. In this class would be developed the taste of the artist, artisan, or cultivator, and formed forever these manual dexterities of the hand—prehension, pression, pressure, tacts, contracts, etc., whose excellence has prepared the success of the mighty laborers—Morse, Gavaret, Faraday—and confers the sceptre of surgery.

These natural treasures refound could be bestowed very cheaply among the masses who need them most, and where they would raise enormously, without further expense, the quality, beauty, and value of all hand-producers.

6. But as the child progresses in his intellectual education, the training of his senses and hand must take a more elevated form.

After having operated unaided, they have to be taught the *modus operandi* of the instruments and methods which give a farther reach than nature to their senses, and a more unerring power to the hand executive of the will.

By this double acumination of the senses and of the hand the child has strengthened his instruction by an almost illimited range of powers to do best what he will like best. Moreover, besides having been taught to perceive the infinite in smallness and in magnitude (instead of only reading about it), his philosophy will be proof against the fooleries of the past; and ready to tender to nature the reverence it deserves, he will feel himself like embedded in the constantly enlarging realities and ideals of this world, as in his true Alma Mater University.

7. All the while the school physician should continue to keep his record of the vital powers; note in graphics or in figures their progress, retardation or retrogression, pointing to the causes thereof; so that when the teacher will dismiss the pupil with his certificate of capacity in the branches of learning, the manager of the vital functions will add a summary of his physiological powers of perception, of action and of endurance—which is, after all, the hard-pan of all capacity. In a word, the teacher's certificate will tell what the aspirant to manhood knows, and the physician's what he can do.

Make up now the sum of these individual powers, and that of the national powers requires only a simple addition. The nation will feel and know her strength.

If anybody supposes this plan to be utopical, let him look at its partial realization in an older or less important branch of the public service. The armies—in other respects barbarous organizations—are fifty years (I hope no more) in advance of the school—an instrument of progress in other than this respect, *i. e.*, the necessity of a more physiological education. In proof of which assertion, two instances forcing themselves here, will detain us but an instant, and I have done.

The expedition of Abyssinia succeeded only because the medical staff of the English army had tested the worth of every man by the method of physical diagnosis, and with the instruments of positive observation, allowing none to join the picked band whose temperature, respiration, two pulses and cardiography had not given normal results. So selected, the valor of these men proved to be equal to their worth; their heroism was natural, and the victor of Magdala was not Hercules, but Esculapius.

To this achievement of the Anglo-Saxon physician let us add another won by our Army Medical Corps. To Drs. Woodward, Billings, Baxter, and their associates, are due those medical and surgical reports and tables of vital statistics which demonstrate (all previous prejudices notwithstanding) the superiority of size, proportions, weight, and endurance in the field and in the hospital of the neo-American.

With a living material more numerous and more sensitive to the changes to be observed, when will the American school be able to show something like this last triumph of army medical science? When school physicians will not be confined to look at the privies,

instead of playing in education a part much more important for society at large than that of the surgeon in the army. This improvement will commence when the Laplaces, Aragos, Cuviers, Humboldts, Virehows, and Littres of this country will be the school authorities.

We live in an age in which the old motors have ceased to move, when credoes are replaced by analyses; when the duty of working at his best becomes general; when, in order to work, everybody needs his physiological aptitudes to be trained as productive capacities; when the public and private records of the school will alone furnish the measure of the capacity of each and of all.

Who will take the duty in charge?

It may be considered hard for men who have spent in studies more than a third of their probable career to devote the rest to a part of their profession so little remunerative, and so fraught with enmities. But these considerations—though strongly appealing to egotism—are powerless against the fiat of a ripe idea. The idea of a more physiological education has ripened out of the failure of scholastic and classical education, like a rich kernel bursts in leaves and fruit out of half-rotten manure.

The irrepressible want of modern times is that all men be educated; all educated men must work; education must prepare them to work at their natural best; this preparation is obtained best by a physiological training; physicians alone can carry that training and give a scientific authenticity to its record; it must be done, therefore they must do it; because—above other causes—the folly of to-day is the wisdom of to-morrow.

A word more and I close this invitation to physicians to take their natural part in education. Some put the riches of this country in its mines, some in its commerce, some in its manufactures, some in its immeasurable breadstuff, some in its inexhaustible herds; but do not believe them. The true riches of this country—without which all others are like chips in the mouth of the hungry—are our children, if physiologically educated.

If I have imparted to you my conviction, you will name a commission to examine the practicability of the intervention of physicians in education, and to report on the same at your next meeting.

———o———

Moral culture is of far more value to every human being, during the first ten years of his life, than intellectual culture. If our public schools are to fit the people for a correct life, it is more important that they be schools of correct morals than that they should excel in imparting a knowledge of reading, writing, arithmetic, geography, and grammar. Once the original American people believed the public schools were the safeguard of our republican institutions; they were right. Then our schools taught more of good manners, "the lesser morals," and of morality, than they did of mere book knowledge.—*E. O. Haven, D.D., LL.D., N. E. Journal of Literature.*

THE COST OF DRINKING HABITS.

Dr. Edward Young, Chief of the Government Bureau of Statistics, reports as follows:

WASHINGTON, D. C., May 27th, 1878.

The only official information I am able to afford, in regard to the consumption of spirituous, vinous, and fermented liquors, is derived from the report of the Commissioner of Internal Revenue, showing the quantity of spirits and beer on which duty was paid; and from the returns to this Bureau showing the quantity and value of spirits and wines imported from foreign countries. The figures are respectively as follows:

Distilled spirits, exclusive of brandy made from fruit, withdrawn for consumption during the year ended June 30, 1877	56,848,525 galls.
Fermented liquors, paying a tax of $1 per barrel	9,074,306 bbls.

IMPORTS OF LIQUORS DURING THE FISCAL YEAR 1877.

Spirits of all kinds	1,386,670 galls.
Wines in casks and bottles, computed in gallons	5,723,469 "
Native wines, brandy, etc., made from the grape and other fruit, and *made* wines	quantity unknown.

From the report of the Commissioner of Internal Revenue for 1877, the following data are obtained:

Amount received from *retail* liquor-dealers paying a special tax of $25 each, ...	$3,840,469
Amount received from *wholesale* liquor-dealers paying a special tax of $100 each, ...	449,729

It will be seen that the total number of retail dealers in the year indicated was 153,618; and of wholesale dealers, 4,497.

The average amount sold by each is unknown, but is estimated as follows:

153,618 retail dealers; average sales, $3,000 each, . .	$460,854,000
4,497 wholesale dealers; average sales, $30,000 each,	134,910,000
	$595,764,000

Another estimate of the aggregate amount of money annually expended in the United States for liquors is as follows:

Whiskey and other spirits, 56,848,525 gallons, at $6 retail, ...	$341,091,150
Fermented liquors, 9,074,306 barrels, at $20 retail, .	181,486,120
Imported brandy and other spirits, 1,386,670 gallons, at $10 retail, ...	13,866,700

Imported wines, 5,723,469 gallons, at $6 retail, . .	34,340,815
Domestic wines, brandies, etc., ...	25,000,000
	$595,784,785

If the foregoing estimates are not excessive, it is evident that the direct cost of the drinking habits of this country exceeds *five hundred and ninety-five million* dollars, or an average of about thirteen dollars for each man, woman, and child in the United States!

Enormous as is this expenditure, it is gratifying to know that there has been a decrease, not only per head, but in the aggregate, which a few years ago exceeded six hundred million dollars, being an average of about $16 per capita.—*Temperance Advocate.*

Convalescence.—The appetite of the convalescent is fitful and capricious; yet his friends insist upon stuffing him at all sorts of odd hours, as if he were destined to fill a tureen *de foie gras*. Between breakfast and luncheon he must swallow some raw meat-juice and a glass of wine; at three P. M. he must take some strong jelly; between dinner and bed-time he has to face beef tea, and during the night-watches he is dosed with Leibig's Extractum Carnis. An attack of biliousness soon follows, which has to be relieved by cooling but unpleasant medicines. The doctor tells him that he never intended him to be overfed in such a manner, and reads him a long lecture on the incapability of the stomach to respond to too frequent calls upon its energies. In place of being over-gorged he is now over-tonicked, until a buzzing in the head and sudden deafness demand rest for the system from medical pick-me-ups. There is yet one more torture in store for him. He is sent abroad. According to the time of year, a German watering-place, or an Anglicized town in the south of France, is selected as the scene of his banishment. The necessary arrangements before leaving home harass him beyond measure. Even were he in good health they would prove a considerable burden. Wearied out by these preliminary worries, he starts upon a long and tiring journey, reaching his destination more dead than alive. To be treated like a child by his courier, humiliates and annoys him; yet he is perfectly helpless in his hands. Likely enough, wet weather, or the *mistral* hails his arrival. Sad, indeed, is then his lot. Confined to the house, as he lies all day in his one sitting-room, he wishes himself back in his comfortable English home, with its choice of rooms and domestic interests.—*Saturday Review.*

The New Baby.—Nurse: "Is it a Cherman or an Enklish papy?"

Lady: "Well, I don't know. You see she was born in England, but my husband is German."

Nurse: "Ach, soh. Zen ve vill vait to see vat lenkvetch she vill schbeak, and zen ve vill know."—*Punch.*

Editor's Table.

The Heating and Ventilation of the Johns Hopkins Hospital continues to receive deserved attention by the Trustees of that institution. The volume of Essays on Hospital Construction, by half a dozen of the most eminent students of the subject in this country, published two years ago,* was an unusually valuable contribution to the literature of the subject—including heating and ventilation as an essential part which the pamphlet of ninety pages, now before us, treats of exclusively.† It consists of a concise statement of the physics of heating and ventilation, in conjunction with deductions from the skilled observations of Surgeon D. L. Huntington, U. S. Army, upon the heating and ventilation of the hospital of the Soldiers' Home, Washington; and a brief report from the same institution, by W. M. Mew, A. A. Surgeon, U. S. A., giving experimental determinations of carbonic acid gas and organic impurities found in the air of the wards; and a record of observations on ventilation of the Barnes Hospital, at Washington, D. C., 1876. These official reports are followed by the recorded experiments and observations of Dr. Edward Cowles, Superintendent of the Boston City Hospital, in that institution, and an examination of air for carbonic acid, showing percentage by volume, by Prof. Edward S. Wood, M.D.

These reports and observations are annotated by Dr. Billings in their several parts and bearings on the different means used, and the varying degrees of excellence attained in the results. His conclusions are that he would not employ exclusively any one system of heating and ventilation, at first, at any rate, because—

I. He is not sufficiently assured of the superiority of any one system of minor details above all others, to be willing to recommend its exclusive adoption, having never seen any system in actual use which could not in some way be improved. He does not, therefore, look for an exception to the rule in this case.

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* See THE SANITARIAN, Vol. IV., p. 181, *et seq.*

† Report on Heating and Ventilation; prepared for the Trustees of the Johns Hopkins Hospital, Baltimore, Md. By John S. Billings, Surgeon U. S. Army, 1878.

II. By careful and scientific trial of several different systems, the hospital will be able to settle, with a fair degree of precision, some of the vexed questions with regard to the relative efficiency and economy of various plans, and this at comparatively small expense.

III. This hospital is to contribute, among other things, to education. It should be able to show various methods and their results; it should be a sort of laboratory of heating and ventilation. From personal examination of numerous methods employed in the principal hospitals in this country and in Europe, he divides the causes of failure into six classes: 1. Want of proper arrangements to prevent contamination of the air—from sewer and illuminating gases, organic emanations, etc. 2. Insufficient areas of flues, for both fresh and foul air. 3. Improper arrangement of flues in regard to currents, etc. 4. Disregard of the power and direction of prevailing winds. 5. Neglect or carelessness in the application of means at hand, owing partly to a desire to reduce the consumption of fuel. 6. Want of intelligent and continuous supervision. These considerations should be kept in view, no matter what the system employ ed; for, however perfect an apparatus may be, or complete the automatic action, frequent intelligent supervision is an essential condition of success. The details comprehend the apparatus for applying hot water, at low temperature, as the most satisfactory and economical means for the main administration building, apothecaries' building, nurses' home, superintendent's residence, kitchen, and hospital wards; and low-pressure steam heat for the amphitheatre and bath-houses.

The ventilation of each building will be effected, under ordinary circumstances, by open fire-places, aspirating chimneys, or ridge ventilators. For accelerating ventilation, high-pressure steam coils are to be used in the aspirating shafts or boxes, and a fan ten feet in diameter, with suitable ducts. Of the use of the fan in ventilation Dr. Billings attaches especial importance to the size and arrangements of the air-ducts, as, according to his observation, failures in its application have been much more in consequence of neglect of these adjuvants than of any particular pattern of fan. The plan of the ducts should be arranged first, and the size of the fan be proportioned to them afterwards.

Hospital Laundry Machinery.—Among the most important of recent improvements in hospital labor to which our attention has been called, is power machinery for laundry purposes. It is well known to our readers that we have for a long time advocated steam and boiling water, with appropriate appurtenances, as efficient

means of disinfecting clothing. We are glad to be informed that the wooden tubs and machines heretofore used for such purposes in hotels and hospitals are now being superseded by iron machines —the parts with which the clothing comes in contact being thoroughly galvanized. The "Smith Patent Cylindrical Washer," in particular, manufactured by Janes & Kirtland, New York, now used at Hoffman Island, New York Quarantine, in several of the State insane asylums, and some of the largest hotels in the city of New York, fulfils the double purpose of cleanliness and safety to a degree which we believe is unequalled by any other machine. It is perfectly tight, and so arranged as to admit of the introduction of both steam and hot water—emptying and refilling at pleasure—without opening the lid or other exposure. With a competent person in charge, the infected clothing of a ship-load of emigrants, or of several hundred hospital patients, may be effectually purified and thoroughly washed in a few hours at most, with but very few hands, which, under any other process, would require destruction, or several days' labor by many individuals.

The Germ Theory of Disease.—Of much that has been written on this subject within ten or a dozen years, the most considerable book on it is the one by Dr. Maclagan.* The author states in his preface that the "one object which he has in view is to rescue the germ theory of disease from what he considers a false and misleading position, and to give to it its true and legitimate standing as a pathological question." He discards at the outset the question whether or not germs ever originate *de novo*, as having no necessary connection with their agency in the cause and propagation of disease. "The theory is," as he defines it, "that many diseases are due to the presence and propagation in the system of minute organisms having no part or share in its normal economy." But "in the case of only two diseases, relapsing fever and splenic fever, have foreign organisms been detected in the blood; and the relation which these bear to the phenomena of the disease during whose course they occur is matter of diversity of opinion." Notwithstanding, the author avouches the germ theory in its entirety, and proceeds to support it by an attempt to account for the phenomena of the specific fevers by the physical effects of the myriads of organisms living in and upon the blood and tissues. The emaciation, thirst, rapidity of circulation, and preternatural heat of fever are explained by an elaboration of the theory: the germs eat

* The Germ Theory applied to the Explanation of the Phenomena of Disease—the Special Fevers. By T. Maclagan, M.D. 8vo. pp. 258. London: Macmillan & Co. $3.00.

up the nitrogenous tissues, and drink up the water of the blood, which are necessary to sustain and nourish the body; and this rapid removal of the material requisite to nutrition accelerates the action of the heart and arteries, and this, added to the consumption of tissue (by the germs) accounts for the elevation of temperature—conditions common to all specific fevers. But inasmuch as the germs are said to increase in numbers proportionally with the progress of morbid phenomena, how any recoveries whatever ever take place is not explained. Moreover, the author should not have omitted to remark that in the highest conditions of health, and at every period of life, myriads of bacterian germs—wholly undistinguishable from those to which he would limit the theory—infest the body, in the interstices of the tissues, the elementary parts, and the epithelial cells of the internal surfaces. Millions are always present on the tongue and throughout the alimentary canal; but all, apparently, in a dormant condition, and without any connection with or influence on the living germinal matter of the tissues themselves, so long as these latter are in a healthy condition.

But under *unhealthy* conditions: if the alimentary secretions become deranged, as, for example, in the indigestions of infants artificially fed, in the aphthous inflammations of the mouth, the sore throat of scarlet fever, the membranes of diphtheria, the suppurating surfaces of wounds, or in abscess, the intestinal track in cholera, and probably in the blood of yellow fever, *et id genus omne*, the germs flourish, and so long as morbid conditions obtain.—Prevent the morbid conditions by better protection against infantile indigestions, it may be; or suppuration, as Professor Lister does, by the use of antiseptics; or the whole category of filth diseases, by cleanliness; infantile contagions, by isolation; small-pox, by vaccination, etc., for the list might be much extended; or when they have not been prevented, arrest their course by appropriate treatment, as it may be and often is arrested: under all such circumstances of both prevention and recovery, though the germs swarm as the dust in the air, though inhaled with the breath, swallowed with food or water, enter the body and the blood in whatever way they may, as they unquestionably do in various ways—in myriads—disassociated from *precedent* unhealthy conditions, they are powerless for evil. Organic matter, in a putrescent state, whether within or without the body, is alike promotive of disease and the presence of organic germs. But the relation of these germs and disease to one another is, in the judgment of the editor hereof, the same as that of vultures and dead animals; and it would be scarcely less reasonable to regard the vultures as the cause of

the death of the animals in the one case, than the germs the cause of the disease in the other. But to all those who would have a summary of the germ theory, understand the foundation upon which it rests, and the arguments advanced in its support—and all physicians require this knowledge—Dr. Maclagan's book is commended.

Visions: A Study of False Sight, is a posthumous work by the late Dr. E. H. Clarke, of Boston, the author of "Sex in Education," and the "Building of a Brain."* This work was written by the author while suffering from the painful disease which ended his life. An introduction by his friend, Dr. Oliver Wendell Holmes, conciliates the favorable attention of the reader to the subject by an interesting obituary notice of this exceptionally successful practitioner, accomplished scholar, and acute thinker of America's literary capital.

But the book is worthy of attention for its own sake. Written in an unusually perspicuous style, cautiously scientific in its investigations and inductions, rich in illustrations and data drawn from the writer's own observation and experience, and graphically narrated, while copious extracts are made from the recorded observations of others, Dr. Clarke has left us, in this volume of 315 pages, a fascinating work, which carries the reader along without difficulty into a careful study, not of false sight only, but of true sight as well; or, at least, of the mental processes which accompany and complete the act of vision. A generation ago Dr. Clarke would have been called a materialist; but while he accepts as true in regard to most of the intellectual processes the conclusions of the eminent mental physiologists of our day; and while in treating of vision, with its relative subjects of memory, association, and volition —most intellectual, as well as cursory processes are shown to be purely automatic—there is always a point in the reasoning where materialistic hypotheses do not prevail, and the existence of the *ego*, the conscious reason and will of man, the free soul that guides and directs the wondrous framework and mechanism of our humanity, is assumed. Vision is shown to be a process, not of photography merely, but of telegraphy from one nerve-centre to another in the brain, until the objective sight is turned into a subjective picture which is thoroughly understood by the thinking soul. The various telegraphic stations more directly concerned are the tubercula quadrigemina, the angular gyrus, and the frontal lobes. The

* With an Introduction and Memorial Sketch by Oliver Wendell Holmes, M.D. Boston: Houghton, Osgood & Co.

retinal impression is instantaneously conveyed to the tubercula quadrigemina, where, by some unknown mechanical, chemical, thermal, or electric change; or by innumerable changes corresponding to the innumerable shades and points of the object seen, it is co-ordinated in the nerve-cells of this organ with a picture or symbol conveyed to the next station, the angular gyrus, where it becomes a full sensory impression. From this station it is, by a similar automatic process, conveyed to various centres of intellection in the frontal lobes, and becomes an irrational picture or apperception. Now these stations are all, by an elaborate system of telegraph lines, consisting of nerve-fibres, connected, in relations of co-ordination and subordination, with nerve-centres of attention, habit, association, emotion, common sensation, and volition; and the whole complex mechanism is kept in motion by the blood supply from the vaso-motor centre. Normal vision depends entirely on the retinal impression thrown into the eye by an external object. Abnormal vision may be induced by various kinds of irritation within the brain; by the action of drugs, the insufficiency or excess of the blood supply, the excitement of emotion, and even by an act of volition, aided by expectant attention, habit, and association. An external object not instantaneously apprehended by the centre of sensory impressions may suffice to put the whole automatic system into motion, the final effect being controlled by internal forces. Sometimes a mere vision of the fancy or imagination is induced, but in rare cases sensory pictures are induced precisely similar in character to those occasioned by external objects, and indistinguishable from them. A few diagrams make the author's views and hypotheses clear to the reader, and each actual case cited is explained in accordance with the foregoing principles. The field of view includes the visions of disease, dreaming, monomania, epilepsy, delirium; those induced by the action of various drugs, including alcohol; the visions of saints and enthusiasts; and, not least in interest, those of the death-bed. While certain technical terms of physiology are used in the book, any general reader of ordinary intelligence and mental culture will enjoy this *theory* of false and true sight.

Population of the City of Providence, January 1, 1878, enumerated under the direction of E. M. Snow, M.D., City Registrar (Report to the Mayor and Board of Aldermen), shows: Population, 99,682; dwelling-houses, 13,879; tenements, 24,805; unoccupied tenements, 2,672; families, 22,133; families to each dwelling, 1.59; persons to each dwelling, 7.18; persons to each family, 4.50; unoccupied dwelling-houses, 638. Compared with

1875, there has been an *increase* of 604 dwelling-houses, 512 families, and 317 unoccupied dwelling-houses; and a *decrease* of 993 in population, since June 1, 1875, when it was 100,675. The decrease is briefly attributed to the unusual depression which has existed for the last two and a half years, causing many persons to go to their homes in the country, where they can live cheaper. "It is probable that the changes in the population produced by it have reached an end. The number of births have constantly exceeded the number of deaths; and whether business revives immediately or not, the population of the city must increase from this time, unless the number of deaths exceeds the number of births.

"As every city within my knowledge, without exception, estimates its population as having largely increased within the last few years, the results of our census may be a suggestive hint that such increased estimates may, possibly, be not well founded." A hint which the editor of THE SANITARIAN earnestly endorses, and commends to correspondents.

Chicago, 1877.*—Population, 439,976. Mortality, exclusive of 713 premature and still births, 8,026—ratio per 1,000, 18.24. A decrease from the previous year of 547. *Chief causes of death:* Zymotic diseases killed 2,519, or 35.71 per cent. of all who died. Of these, scarlet fever killed 819; diarrhœal diseases, 812; diphtheria, 331; croup, 230; typhoid fever, 159. Consumption killed 773; pneumonia, 313. *The* disease which, of all others, has continued to give the Health Department the most concern has been scarlatina, which has prevailed for two years. The number of deaths from it in 1876 was 791; 1877, 810. Number of cases reported for the two years, 2,205; fatal, 36.73 per cent. According to its usual wont, it has been most fatal in that portion of the city which is most filthy—regardless of crowding: 74,019 of the population living in filthy wards, gave 40.96 per cent. of the mortality from zymotic diseases, while having 10½ persons to the acre; 75,261 living in cleanly wards, with a population of 30½ to the acre, gave only a little more than half as much, or 23.57 per cent. Diphtheria: of 122 houses in which it prevailed, but 13 only were in good sanitary condition; the others were deficient in ventilation, plumbing arrangements, or in some other particulars filthy. Defective house drainage is a prevailing evil. A good many old privy vaults are still tolerated in the filthiest parts of the city, aggravating the difficulty of effective scavenging, and promoting disease.

The remainder of the report is taken up with brief but intelligent

* Report of the Department of Health of the City of Chicago for the year 1877. Oscar C. DeWolff, M.D., Commissioner of Health.

reports on water supply, sanitary police, food inspections, removal of dead animals, small-pox, and nuisances. A table of births registered is appended, but it makes no pretensions to completeness, and is of no statistical value.

Dayton,* with an estimated population of 37,000 for the year ending December 31, 1871, reports: *Births* recorded, presumed to be "practically correct," 932—25.18 per 1,000; *Deaths*, exclusive of 75 brought to the city for interment, and 40 still-births, 424. Ratio per 1,000, 11.45. A table is appended showing the annual ratio of deaths for thirty-two cities, in which Dayton ranks next to St. Louis (which gives 11.32), and the Health Officer felicitates himself and the City Council on the comparative results. But it is the misfortune of all such comparisons that no account is taken of the want of uniformity in making up mortality statistics. Had Dayton included, as all ought to, and most cities do, those brought to the city for interment (inasmuch as they are usually of their own population who have died away), her ratio would read 14 per 1,000, instead of 11.45. But this in no respect detracts from the assiduous attention and commendable zeal of the Health Officer, and those associated with him in the sanitary administration. The good results are best shown by the small proportion of zymotic diseases—82, or less than 5 per cent. of the total deaths. Notwithstanding, among these, typhoid fever, 13, and diphtheria, 11, show persistent criminal mortality in neglected filth. The suggestions of the Health Officer in this regard, under sewage matters, streets and alleys, slaughter-houses and pig-pens, and water supply, the city authorities would do well to heed.

Rochester Water Supply.†—Already the readers of THE SANITARIAN are somewhat familiar with the efforts of the Rochester Health Department to secure a pure water supply. Two years ago numerous cases of typhoid fever were traced to impure well-water, to wells which were in proximity to privy vaults and cesspools in that city. The fishy odor of the Hemlock Lake water had caused considerable alarm among the people, and uneasiness among some of the physicians; this was set at rest, and the true source of the mischief traced by the investigations of Professor Lattimore.‡ The

* Eleventh Annual Report of the Board of Health to the City Council for the year ending February 28th, 1878. Thomas L. Neal, M.D., Health Officer.

† Report to the Executive Board and the Board of Health of the City of Rochester, N. Y., for the year ending March 1st, 1868. By S. A. Lattimore, Ph.D., LL.D., Professor of Chemistry in the University of Rochester. Rochester: N. Y.

‡ THE SANITARIAN, Vol. 5, pp. 323 and 334.

report now under consideration is not only a full verification of his previous conclusions, in regard to the poisonous well-water, and the innocuousness of the fishy odors and uncertain causes which have occasionally given rise to them in storage reservoirs, but an unusually valuable summary of the results of water analysis in general, and of Hemlock Lake water in particular. But now "this city may well congratulate itself on possessing a water supply beyond suspicion of sewage contamination, and which does not even require filtering. As to well-water, once contaminated—and all our wells are in danger—purification, by any means, to a degree of safety, is impossible." And—

"The time is at hand, if it has not already come, when the existence of any considerable amount of several of the zymotic diseases in any city which can, at any cost, command an adequate supply of pure water, shall be held by intelligent men as evidence of gross and criminal neglect of all known sanitary laws. In the light of such knowledge should this important municipal trust be administered." A sentiment which all true sanitarians will heartily endorse.

Long Island City.—MR. EDITOR: Permit an occasional sufferer from the vile stenches which emanate from Newtown Creek to thank THE SANITARIAN (September number) for its vigorous denunciation of that intolerable nuisance.

Will nothing but a pestilence, fatal as that of Grenada, arouse the authorities and the people of Long Island City to a realizing sense of the peril to which they are exposed?

A Gatling gun, veering with every change of the wind, and even sweeping the field to the leeward, would be comparatively merciful in its operation to the morbific influences which often saturate and contaminate the air of Hunter's Point and vicinity.

The writer, living nearly three miles to the north of that detestable region, can testify to the sickening exhalations which taint every southern breeze, and especially so when an ebb tide lays naked and bare the black and slimy sides and bottom of Newtown Creek; then come odors and baneful influences from which Dante might have borrowed horrors which would have lent additional pungency to his imagery of hell.

"Lay on, Macduff," etc., until the people who suffer and die of *filth diseases* are "taught the reason why," and are thus enabled to avoid them. ASTORIAN.

Sept. 1, 1878.

Death-rates per 1,000 inhabitants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Pox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Type Fevs	Malarial Fevers.	Diarrhœal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500—4 weeks ending August 24	2202	28.81	1144	361		45	46	5	11	38	27	22	609	18	176
Philadelphia, 850,900—4 weeks ending Aug. 31	1244	19.05	588	156		19	16		10	28	55	2	195	3	16
Brooklyn, 528,000—4 weeks ending Aug. 24	1012	19.02	553	117		22	4	9	10	30	7		289	3	64
St. Louis, 500,000—2 weeks ending Aug. 24	264	13.68	134	18		3	2	1	4	4	2	22	30	2	18
Chicago, 460,000—4 weeks ending Aug. 31	736	20.85	404	50		18	10	3	2	25	15		190	7	48
Baltimore, 350,000—4 weeks ending Sep. 7	531	15.81	243			22	13		5	14	23		65		50
Boston, 363,000—5 weeks ending Aug. 31	864	24.84	380	110		28	4	5	2	23	14		307	6	
Cincinnati, 280,000—4 weeks ending Aug. 31	378	17.59	214	43		5	17		1	4	10		48		38
San Francisco, 300,000—month of July	375	14.73	158	52		4			3		15		35		28
New Orleans, 210,000—4 weeks ending Aug. 25	1190	73.71	321	46		4			1		*9	130	45	3	24
Washington, 160,000—month of July	473	35.47	284	59			14	2		1	14	3	104		38
Pittsburgh, 145,000—month of Aug	285	26.00	156	25	2	56	11			4	16	3	55	2	20
Newark, 126,000—															
Providence, 100,000—month of Aug	175	21.00	87	23		13	5		1	11	2		30		2
Milwaukee, 123,000—															
Rochester, 70,000—month of July	104	17.49	46	5						1	1		6		8
Richmond, 77.000—4 weeks ending Aug. 31	127	25.01	29	21		2	5		2	1	4	2	17		15
New Haven, 60,000—month of Aug	92	18.4	42	13		3	2	1	1	1	2	1	17	2	
Charleston, 57,000—4 weeks ending Aug. 31	120	27.44	50												11
Toledo, 50,000—month of July	65	15.60	34	6							1	2	16		5
Mobile, 40,000—month of July	69	23.14	25	12							1	1	5		8
Dayton, 36,000—5 weeks ending Sep. 4	57	14.33		9						5	1		8		
Nashville, 27,000—month of Aug	60	26.52	25	10					1				10		7
Wheeling, 28,000—															
Buffalo, 170,000—															
Knoxville, 13,000—															
Paterson, 40,000—															
Petersburg, 20,000—															
Selma, 8,000—															
Elmira, 20,000—month of Aug	53	20.6	30	2		16			1				11		3
Yonkers, 18,500—month of Aug	38	24.18	16	2			1						11		
Memphis, 45,000—															
Detroit, 125,000—month of May	161	15.16	67	24	3		9			2	2	1	1		8
Syracuse, 60,000—month of August	85	16.67	35	15							3		23		
Reading, 40,000—															
Sacramento, 25,000—month of July	37	17.42	13												1
Minneapolis, 44,000—month of July	53	14.18	33	4									27		
Bowling Green, 6,000—															
St. Paul—															
Cleveland, 163,000—4 weeks ending Aug 10	316	25.35	223	16		20	1		1	4	4	1	97	1	19
Erie, 27,000—month of Aug	34	14.42		2		1					2		8		5
Jacksonville, 10,000—															
New Brunswick, 16,660—30 days ending Aug 14	34	24.8	13	1		1		1		4	1		5		2

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Correspondents under this head are particularly requested to forward their communications *regularly*.

* Yellow fever, 616.

Foreign Mortality.—Ratio per 1,000 inhabitants annually. August 11–17: London, 22.1; Glasgow, 21.2; Liverpool, 33.0; Birmingham, 33.2; Manchester, 26.2; Dublin, 29.2; Leeds, 31.0; Sheffield, 26.5; Edinburgh, 18.7; Bristol, 23.5; Belfast, 28.8; Bradford, 28.2; Salford, 32.2; Newcastle, 29.2; Hull, 34.6. August 4–10: Amsterdam, 26.8; Rotterdam, 33.5; The Hague, 26. August 10–16: Paris, 23.9. August 2–8: Lyons, 28.4. Month of July: Marseilles, 36.7. June 16–30: Lille, 21.1. August 1–7: Havre, 20.3. July 28 to August 3: Berlin, 29.1. August 4–10: Hamburg, 27.7; Breslau, 42.8; Munich, 39.4; Dresden, 32.6. August 11–17: Cologne, 32.6; Leipzig, 27. August 4–10: Koenigsberg, 36.5. August 11–17: Frankfort-on-the-Main, 21.9. August, 4–10: Hanover, 32.2; Bremen, 18.3. August 11–17: Dantzig, 29.7. August 4–10: Stuttgart, 21.4; Strasbourg, 35.7; Nuremberg, 27.7; Barmen, 20.8; Magdeburg, 25.8; Altona, 29.1; Elberfeld, 26.6; Dusseldorf, 39.2; Stettin, 31.4; Chemnitz, 29.5; Aix-la-Chapelle, 28.2. August 11–17: Brussels, 24.2; Anvers, 20.3; Gand, 32.2; Liege, 19.3. August 4–10: Vienna, 22.2; Buda-Pesth, 37.4; Prague, 22.0; Trieste, 35.4; Lemberg, 21.4. August 7–13: Copenhagen, 33.7. August 4–10: Stockholm, 30.9.; Christiania, 18.4. July 28 to August 3: St. Petersburg, 40.0. August 4–10: Warsaw, 32.8; Odessa, 74.0. July 16–22: Naples, 31.4. Month of June: Milan, 15.5. July 28 to August 3: Turin, 23.4. Month of June: Genoa, 22.1. August 4–10: Venice, 18.1. Month of June: Bologna, 22.9. August 4–10; Bucharest, 32.1. July 28 to August 3: Alexandria, 53.5. May 16–31: Rio de Janeiro, 71.7. June 30 to July 6: Calcutta, 24.4. July 10–16: Bombay, 37.8. June 22–28: Madras, 34.6.

Yellow Fever.—"WASHINGTON, September 14th, 1878:

Memphis.—During the week ended six o'clock, September 12th, there were 687 deaths from yellow fever. It is impossible for the Memphis authorities to ascertain the number of cases.

Brownsville, Tenn.—The first case of probable yellow fever occurred on the 29th of August, resulting in death September 2d, since which time there have been nine deaths from yellow fever. There were thirty cases under treatment last evening. At least two-thirds of the population fled the city between the 1st and 4th inst.

Holly Springs.—116 new cases of yellow fever and 42 deaths occurred during the week ended yesterday evening, making in all 216 cases and 67 deaths. All of the resident physicians are sick.

Canton, Miss.—150 new cases of yellow fever and 20 deaths for the week ended yesterday evening. First case August 1st. Total cases, 340; total deaths, 50.

Fort Gibson, Miss.—Dr. Wharton, of Mississippi State Health Board, reports about 500 cases of yellow fever and 94 deaths to yesterday noon, and "very few subjects left to take it."

Water Valley, Miss.—One citizen taken with yellow fever September 1st, and died on the 7th. No other cases to yesterday evening, since the refugee cases reported in August.

Ocean Springs, Miss.—16 cases of yellow fever and 4 deaths occurred during the week ended yesterday evening, making 34 cases and 9 deaths in all since commencement, August 30th.

Pass Christian, Miss.—From August 29th to September 9th there were 15 cases of yellow fever and one death.

Bay St. Louis, Miss.—6 cases of yellow fever developed in Bay St. Louis during the last week, 2 deaths. No new cases yesterday.

Pascagoula, Miss.—One of the cases previously reported since died. No new cases.

New Orleans.—During the week ending yesterday noon there were 1,528 cases of yellow fever and 530 deaths, making in all 6,137 cases and 1,925 deaths. In the last twenty-four hours, to Friday noon, there were 228 cases and 58 deaths.

Plaquemine, La.—175 cases of yellow fever and 37 deaths had occurred up to September 8th.

Morgan City, La.—There have been 25 cases of yellow fever and 8 deaths, of which 3 cases and 2 deaths occurred during the past week.

Port Eads, La.—No cases and no deaths from yellow fever during last week. There were 21 cases and 2 deaths from August 16th to 31st—period not previously reported—making in all 67 cases and 8 deaths.

Mobile.—One death from yellow fever occurred on the 9th inst. No other cases to last evening. City healthy.

St. Louis.—During the week there were 2 cases, of local origin, said by some to be yellow fever, disputed by others; one died, the other was sent to Quarantine Hospital, where 9 refugees died of yellow fever during the same period.

Cairo.—The editor of the Cairo *Bulletin* died of yellow fever on the 12th inst.; one employé of the *Bulletin* office died yesterday. No other cases. On the 4th inst. 4 members of a family, residing two miles from Cairo, on the bank of the Mississippi, were suddenly stricken with yellow fever; on the 10th the remaining two members of the family were attacked; one died. The children found an abandoned skiff in the river, and removed it to the house for repair. Three or four days afterward all who were around the boat were stricken with fever in one day. The Quarantine physician

dissents from the diagnosis of the attending and consulting physicians.

Hickman, Ky.—The telegraph operator reported dead. No other information obtained.

Louisville.—There were 19 new cases of yellow fever and 7 deaths for the week ended yesterday evening—all refugees.

Cincinnati.—From September 4th to yesterday evening there were 7 cases of yellow fever and 4 deaths. All of whom were recently from infected places South.

Gallipolis, Ohio.—There have been 25 cases of yellow fever and 9 deaths, resulting from communication with the steamboat "John D. Porter," and her barges, while anchored near Gallipolis. This vessel and her infected barges ascended the Mississippi and Ohio Rivers from New Orleans to Gallipolis, with effect much like a fire-brand among explosives. The local health authorities could only prevent her landing, and the law forbids this office interfering in such cases.

Key West.—One case of yellow fever and one death during the past week.

Kingston, Jamaica, September 3d.—A few cases of yellow fever have occurred at Port Royal, six miles from Kingston, one proved fatal. The steamship "Etna," from Haiti, arrived at Kingston on the 1st inst., with the purser sick of yellow fever contracted in Haiti.

Calcutta.—There were 11 deaths from cholera and 20 from small-pox during the week ended July 13th.

Bombay.—22 deaths from cholera and 9 from small-pox, during the week ended July 23d.

Havana.—51 deaths from yellow fever and 5 from small-pox during the week ended September 7th.

During the week ended August 24th there were 24 deaths from scarlet fever in *Birmingham*, England, and the same number in *Liverpool* and *London*. In *Hamburg* there were 31 deaths from typhus fever, 11 from enteric fever, and 20 from diphtheria in the same week.

In *Alexandria*, Egypt, the annual rate of mortality per 1,000 of the population, based on the weekly mortality for the week ended August 8th, was 58.8.

No official reports could be obtained from Vicksburg, Grenada, Baton Rogue, Bolton, etc.

Reports from other places indicate good health.

JNO. M. WOODWORTH,
Surgeon-General U. S. Marine Hospital Service."

That Yellow Fever has not prevailed in New York and Brooklyn, and several other cities north of its more usual latitudes, the past summer, is not by any means due to certain acts of inhumanity which have been committed against the sick afflicted with it, and the well flying from it, but to the good fortune of these cities in that while they tolerate the local conditions, they have not been subject to a continuous high temperature for several weeks—above seventy-five degrees—also necessary to it. But the present exemption is no guaranty for the future. So long as people tolerate the local conditions, they continue to risk the recurrence of an exceptional season of high temperature with results the same as have been in the past.

Yellow fever is eminently portable to places of like conditions as those in which it originates by means of *fomites*—clothing, books, dunnage, certain articles of merchandise, ballast; and, above all, by filthy vessels—packed up or closed in, in the places where and when the disease is prevailing; hence the necessity of quarantine of such materials until they are disinfected. But inasmuch as the disease is *not personally contagious*—is not communicable from one person to another—persons should in all cases be allowed their freedom, no matter what the degree of exposure to which they have been subject. And during the prevalence of an epidemic in any place, everybody should be encouraged and aided, as far as practicable, to escape from it as the surest means of safety.

The sick with yellow fever should be cared for under such circumstances as will most conduce to their recovery; and as they are never dangerous to the surroundings, *cannot* give the disease to any other person or thing, to remove such sick persons from healthy places, or take them from the care of their friends to out-of-the-way places, or, as has been practised in New York and Brooklyn, take them to the Quarantine Hospital, is alike calculated to render such cases more dangerous, and to alarm the public on a false issue.

In illustration of its non-contagiousness: during naval service in the Mexican war the writer messed and slept in a room of about 8,000 cubic feet capacity, but sufficiently open for the wind to blow through it, with from five to thirteen yellow fever patients for his companions for several weeks; and in an adjoining room belonging to the same building (the Salmadino Hospital, wholly built of unplaned pine boards, on an island near Vera Cruz), with an open doorway between, containing at no time less than forty, and for a large portion of the time over a hundred other cases, *without taking the disease.* But subsequently, at the end of one week spent on board an infected ship, he was stricken with it.

Again: at Fort Hamilton, in 1856, while attending Dr. Joseph H. Baily, of the United States Army, with yellow fever, and fearing the worst results from a relapse which overtook him in that then badly infected place, the writer had him carefully transferred on a bed in an easy wagon to the family of a brother, and the nursing care of his devoted wife, in Fourteenth street, New York, for which the public was none the wiser nor the worse. Dr. Baily and those who took care of him still live to rejoice over the result. It is almost needless to add nobody was made sick by the "risk."

In the New York Quarantine, while in charge of the yellow fever hospital ship—in the lower Bay, in 1862, and with yellow fever patients on board—the writer took his wife and young children on board for aeration, which they much enjoyed. And there he also permitted the devoted wife of a naval officer to watch over and bathe the brow of her husband during several days while he was *in extremis* with black vomit, to hold his hand at death, and to attend the burial. Thence she returned for a few days to the Mansion House, Brooklyn; and to her home. Nothing but good ever came of it.

Of good riddance, and the effect of freedom from an infected place: During the same service in Quarantine, about the middle of September, the United States steamer "Delaware," belonging to the Quartermaster's Department, arrived from Port Royal with over one hundred of crew and invalid soldiers on board, infected with yellow fever. Three died on the voyage; three cases were sent to the Floating Hospital; and the great danger of forty-six invalid soldiers, and more than as many more of other persons who had not had the disease, requiring immediate relief, was reported to the Commissioners of Quarantine. Three days having been fruitlessly spent in an effort to charter a hulk to which those well persons might be transferred, to cover the bugaboo period of "incubation," and, meanwhile, from three to seven new cases occurring daily, the writer took the responsibility of having every person on board, except necessary ship-keepers, washed, and dressed in clean suits, and sent to the Floating Hospital. There he kept them, though in rather close quarters (with due allowance for the sick) for a week, by the end of which time a transfer vessel was obtained, on board which they were placed and kept (not by the advice or authority of the writer) for two weeks longer; but *from the time they were removed from the infected ship "Delaware" not another case occurred among them.* So much for elimination, as against development.

The American Public Health Association should not fail of a meeting as soon as practicable after the cessation of the

still prevailing epidemic of yellow fever. While all the facts in relation to it are fresh in the memory, and when information is most easily obtained from those who have been engaged in it, is the time to collate them and make them practically useful for the future. Moreover, it should be held in New York, the commercial heart of the country, as the place above all others most concerned and best calculated to attract the largest attendance and secure the greatest benefit.

Asphalt Pavements—which THE SANITARIAN has heretofore commended for their superior qualities of imperviousness against filth, saturation, and disease, in addition to their other good qualities for both man and beast for roadways—seem to have been jumped at rather hastily in some communities. In a recent issue of the London *Lancet* they are condemned for their hardness and slipperiness, and wood—of all pavements the most slippery when new, and the most detrimental to health when old—advocated instead. In New Jersey, according to the Elizabeth *Journal*, and some other reports, they are so soft and sticky that they draw off the shoes from the horses and the tires from the wheels! Alas! alas! for these foreigners, that they should rehearse the experiments first made with asphalt and coal tar—make flint in the one case and a poultice in the other.

The asphalt pavements advocated by THE SANITARIAN are neither, but such as those extensively laid in Brooklyn by the Abbott Pavement Co.—made by mixing gravel and broken stone with the asphalt in such proportions as to avoid both the extremes complained of. It has been in use in Brooklyn for eight or ten years on streets and avenues subject to the utmost use, and with more satisfaction than any other pavement. It is most of all commendable to cities in localities subject to soil saturation, as the best of all pavements to prevent poisonous exhalations; and also for cellars, to prevent the percolation of soil gases under the walls, and through the floors, as laid by T. New, it is the best of all protections.

Garden City's Fruitful Fields are the constant theme of admiration and remark of the throng of railroad travellers who pass through them to the more distant parts of Long Island. The tall rye, oats, and wheat which have given such a pleasing landscape to the *fertile* Hempstead Plains throughout the summer are now gathered into great groups of yellow stacks, roofed over and waiting their turn in the agricultural warehouse, which for completeness, excellence, and labor-saving machinery, probably surpasses that of any other plantation in the State.

Great fields of Indian corn are still waving, and the buckwheat

fields—the pioneer crops of the virgin land of the plains—now extend over large areas never before known to produce anything but prairie-grass.

All along the great avenues which intersect and bound these fields the landscape is enlivened by thousands of thrifty young trees, which for variety, color, and beauty excel any similar area in the world. Maples of a dozen species, ash, spruce, various species of pine, larch, fir, hemlock, horse-chestnut, linden, elm, aspen, catalpa, arbor-vitæ, althea, beech, chestnut, apple, cherry, peach, plum, pear—and thousands of ornamental shrubs whose mere names it would require several pages to catalogue—stud the plains over. And all this wealth of vegetation is now made eminently *social.*

The Cathedral Schools have again opened, occupying five *ad interim* buildings, while awaiting the special structures in prospect. An *ad interim* chapel, of a hundred and fifty sittings, has also been recently fitted up. Meanwhile the Cathedral is progressing to completion. The spire is mounted with an illuminant cross of unequalled beauty, which, when lighted up, will probably be visible from Prospect Park, Brooklyn, and far out at sea.

And where was ever a more fitting place for the cultivation of the young mind, and body, and heart? The Human lives not with this or that natural body, but with all the surroundings; the landscape, with all its elements, acts upon his tone of mind, and imperceptibly upon his entire inward nature. Only gradually, in advanced culture, does it become possible to extricate the individual components out of the picture, and to analyze the impressions made upon youth into their separate influences. Not the grass, but the Meadow; nor the tree, but the Wood; nor the bush, but the WHOLE LANDSCAPE of childhood's surroundings, draws itself like a girdle and works out influences of good or ill to the natural man. "Green the golden tree of life," and this it is, however mysterious and difficult to trace in its action, which interferes most powerfully in determining, restraining, or promoting the qualities of the head and the heart.

The Long Island Railroad, with the now no longer doubtful fruitfulness of the Plains and "Barrens," has, under the management of its present officers during the summer just over, done more to promote the interest and prosperity of the people of Long Island than all their predecessors since the road was constructed. With plans already in progress for taking New York street dirt and other fertilizers to the farmers at mere nominal charges, and arrangements for the utmost facility in the transportation of produce to Brooklyn and New York, Long Island lands will, ere long, open up to enterprising agriculturists and new settlers, fortunes at their very doors never before dreamed of.

Appleton's School Readers, a new series, prepared jointly by Superintendent Harris, of the St. Louis schools, Superintendent Rickoff, of Cleveland, and Mr. Bailey, instructor in elocution at Yale College, will give pleasure to both teachers and scholars. The directions given to the teacher are brief and sensible—extremes of method being avoided, while the use of the *phonic*, supplemented by the *word* method, is encouraged. All the Readers are handsomely illustrated, due weight being given to the educational value of pictures. Here and there, too, are to be found model letters written by boys and girls, and printed in script.

The Model Copy-Books, also published by the Messrs. Appleton, use Goodman's patent sliding copies. Here, too, the printed directions for teacher and scholar are to be commended for their simplicity and judicious avoidance of extremes.

Two Addresses delivered at Plymouth Church by George Müller, the founder of the orphan houses on Ashley Down, and giving briefly the history of his "life of trust," are published by A. S. Barnes & Co., and form an interesting pamphlet of fifty-seven pages.

A Paper on Tramps, read by its author, Professor Wayland, of Yale College, before the American Social Science Association, states the problem fairly, and favors, with many arguments, the adoption of the bill offered to the New York Assembly by the State Charities Aid Association. The bill provides for the establishment of district workhouses, with educational as well as primitive methods of operation.

What Am I?—the title of a valedictory address to the graduates of the Medical Department of the University of Louisville, by Dr. J. M. Bodine—is a scholarly and eloquent sermon on atheism in the medical profession. After a brief inquiry into those characteristics of a physician's life which tend to lead him into a denial or practical ignoring of the existence of God, the address goes on to show that this tendency is due to narrowness rather than broadness of views, and that the physician has special opportunities to search into the final cause of suffering, and to inquire out the philosophy of life. The orator deplores the haste of most medical students to begin their medical studies proper without that general mental training which would make them broad and accurate thinkers, and therefore true scientists.

Electric Lighting* is a timely treatise on a deeply interesting

*A Practical Treatise. By Hippolyte Fontaine. Translated from the French by Paget Higgs, LL.D., Assoc. Inst. C. E. 8vo, pp. 194. With Forty-eight Engravings in the Text. London: E. & F. N. Spon, 46 Charing Cross. New York: 446 Broome street.

subject, now attracting attention almost everywhere. The author sketches the history of the invention and shows the state of progress in the application of electric lighting, with illustrations of the machinery adapted to particular purposes, and the relative cost as compared with gas and other means of illumination hitherto in use. And while the superior advantages of electric lighting are shown for light-houses and other maritime service, for fortifications, for mines, for manufactories, show-rooms, large establishments in general and open-air spaces, its inadaptation to domestic use is also made clearly manifest. A straightforward, honest book, useful to all persons interested in the subject of which it treats.

Sewer Gas and House Drainage: "How to keep out the Former and How to Construct and Ventilate the Latter,"† also just published by the Messrs. Spon, is a pamphlet of twelve pages, useful to all householders. Price 40 cents.

Swinton's Outlines of the World's History‡ is an admirable epitome of knowledge necessary to students completing their course of education in the academic classes of public schools, high schools, and seminaries, fully illustrated, with maps, marginal notes, and dates, making it easy for both teachers and pupils to fix attention on the leading subjects.*

Swinton's Complete Course of Geography,§ and **Elementary Geography,**‖ are also excellent school-books, each one complete in itself, and well adapted to the different grades of study in the same or different schools. The illustrations and maps in both are excellent, and the text devoid of redundancy. Atgar's System of Map-drawings is appended to each, greatly facilitating this necessary exercise in the study of geography, and promoting the art of drawing.*

Cathcart's Literary Reader¶ comprehends a selection, ad-

† An Architect's Letter. By Henry Masters, Architect and Surveyor.

‡ Outlines of the World's History, Ancient, Mediæval, and Modern, with Special Relation to the History of Civilization and the Progress of Mankind. For use in the Higher Classes in Public Schools, and in High Schools, Academies, Seminaries, etc. By William Swinton, Author, etc.

§ Complete Course in Geography; Physical, Industrial, and Political, with Special Geography for each State.

‖ Elementary Course in Geography, designed for Primary and Intermediate Grades, and as a Complete Shorter Course.

¶ The Literary Reader: Typical Selections from some of the best British and American Authors, from Shakespeare to the present time, Chronologically Arranged; with Biographical and Critical Sketches, and numerous Notes, etc., etc. By George R. Cathcart.

* Ivison, Blakeman, Taylor & Co., New York and Chicago.

mirable alike in substance and object, for reading exercises in the higher classes of common schools and academies; it being much less a work on systematic literature than a practical means of inculcating a fair knowledge of the best writings of the best authors, both American and English.*

Townsend's Shorter Course in Civil Government.† —An abstract of a more elaborate work on the same subject, adapted to a less advanced class of students. The subject is judiciously divided into short lessons, with questions, comprehending such knowledge as every individual, however limited the education, ought to know, to make him an intelligent citizen of the United States.*

Fowne's Manual of Chemistry‡ is so well known and so generally recognized as one of the best manuals of chemistry ever published, that the reviewer need do little more than announce "a new American edition," from the *twelfth* English—compressing the two volumes of this into one handsome 12mo of over a thousand pages—comprehending all the recent advances in the science, and the whole elaborately illustrated. There is abundant reason for believing that it will long continue to maintain the prestige which it so well merits. The mechanical execution of the work is in keeping with the text—the best of its kind.

Duhring's Atlas of Skin Diseases, Part IV., is published.§ This part, like those which have preceded it, continues to represent the highest standard of pathological art in the life-like illustrations which characterize the work—an honor to both author and publishers—and of which the medical profession in the United States may well feel proud. The plates of this part are: *Virtiligo*, *Alopecia Areta*, *Tinea-Favosa*, and *Eczema* (*Rubrum*), each one an admirable work of art.

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* Ivison, Blakeman, Taylor & Co., New York and Chicago.

† Consisting of Seventy Lessons. Arranged in Topics, with numerous Questions for Convenience and Reaching. Prepared for the use of Common, Select, and Grammar Schools. By Calvin Townsend, Counsellor at Law, etc.

‡ Revised and Corrected by Henry Watts, B.A., F.R.S., Editor of the *Journal of the Chemical Society*; Author of "A Dictionary of Chemistry," etc. A new American from the twelfth English edition. Edited by Robert Bridges, M.D., Professor of Chemistry in the Philadelphia College of Pharmacy. 12mo, pp. 1,027. With One Hundred and Seventy-seven Illustrations. Philadelphia: H. C. Lea.

§ Atlas of Skin Diseases. By Louis A. Duhring, M.D., Professor of Skin Diseases in the University of Pennsylvania; Physician to the Dispensary for Skin Diseases, Philadelphia; Dermatologist to the Philadelphia Hospital, etc. Philadelphia: J. B. Lippincott & Co. $2.50 per part.

Gynecological Transactions, Volume II.,* contains a list of the Fellows, Minutes of Proceedings, and Papers read before the Society at the meeting held in Boston, May 30th to June 1st, 1878. Numerically, this is the work of a society unusually small in membership—only forty-six fellows and twelve honorary members—but for magnitude and excellence of work it is unequalled. Twenty-two pages are devoted to the catalogue of membership and honorary members. The remainder of the volume is wholly taken up with prepared papers, beginning with the Annual Address by the President, Dr. Fordyce Barker, of New York, on the practical work of the Society and suggestions for its continued prosperity. Following Prof. Barker's address are papers on

Functions of the Anal Sphincters, James R. Chadwick, M.D.; Amputations and Excisions of the Cervix Uteri, John Byrne, M.D.; Report on the Corpus Luteum, John C. Dalton, M.D.; Pathology and Treatment of Puerperal Eclampsia, Prof. Otto Spiegelberg; Relation of the Cervix Uteri for the Arrest of Uterine Hemorrhage, G. H. Lyman, M.D.; Principles of Gynecological Surgery applied in Obstetrical Operations, A. J. C. Skene, M.D.; Researches on the Mucous Membrane of the Uterus, G. F. Englemann, M.D.; Necessity of Caution in the Employment of Chloroform during Labor, W. T. Lusk, M.D.; Present Status of the Intra-Uterine Stem in the Treatment of Flexions of the Uterus, Ely Van de Warker, M.D.; Vaginal Ovariotomy, William Goodell, M.D.; Is There a Proper Field for Battey's Operation? Robert Battey, M.D.; Sub-sulphate of Iron as an Antiseptic in the Surgery of the Pelvis, H. P. C. Wilson, M.D.; Ovariotomy, followed by Fatal Tetanus, Theophilus Parvin, M.D.; Sarcoma of the Ovaries, Washington L. Atlee, M.D.; Value of Electrolysis in the Treatment of Ovarian Tumors, Paul F. Mundé, M.D.; Congenital Absence and Accidental Atresia of the Vagina, Thomas Addis Emmet, M.D.; Sarcema of the Kidney, W. H. Geddings, M.D.; Xenomenia, Theophilus Parvin, M.D.; Hystero Neurosis, G. F. Engelmann, M.D.; In Memoriam, Charles F. Buckingham, George H. Lyman, M.D.; Important Points Connected with Ovariotomy, Gilman Kimball, M.D.; Treatment of Dysmenorrhœa and Sterility, Ellwood Wilson, M.D.; Dr. Uvedaletbest's Views of Rotation, etc., John P. Reynolds, M.D.; Vascular Tumors of the Female Urethra, A. R. Jackson, M.D.; Perineal Laceration, Thaddeus A. Reamy, M.D.; Lying-in Institutions, Henry J. Carrigues, M.D.; The Menstrual Cycle, John Goodman, M.D.; and a copious Index.

* Transactions of the American Gynecological Society, Vol. II. For the Year 1877. Pages 697. Twelve Chromo-lithographs and many other Illustrations. Price $6.50. Boston: Houghton, Osgood & Co.

The names of the authors of these papers are a sufficient commendation—recognized leaders in this particular branch of medicine. Physicians can ill afford to do without this volume. The publisher's part of the work is worthy of its contents. Many of the papers are handsomely illustrated with chromo-lithographic plates, photographs and diagrams. The work is altogether an admirable example of excellence.

International Review.—September–October: The Cry of Labor—What Answer? by President Chadbourne (of Williams College); Only the Shadow of a Gourd, by Alan Broderick, M.A. (of England); Ex-Premier Gladstone, by an American; European Politics, by E. de Pressensé (late Member of the Chambre des Députés); An Epicedium for Queen Mercedes, by Joel Benton; Russia (II.), by Karl Blind (of England); Pilgrim Caravans in the East, by Selah Merrill (Archæologist of the Palestine Exploration Society); The Centenary of Rousseau (II.), by Rev. Samuel Osgood, D.D.; Recent Changes in State Constitutions, by Wilmot L. Warren; Mr. Stanley as an Explorer, by Gen. F. F. Millen; The Spelling of Shakespeare's Name, by Edward S. Van Winkle. Contemporary Literature: Reviewing the literary movement in America, England, Germany, and France.

The *Review* is international in character as well as name, and covers a wide range of reading. It now occupies a position in this country and Europe of the highest importance. It is published every two months, and enjoys the confidence of all classes. May be obtained through local dealers, or by mail from the publishers, A. S. Barnes & Co., New York. $1.00 a number; $5.00 a year.

Labor and the Republic—Atlas Essays, No. 3.—An abstract of ten papers from the *International Review*, selected with especial reference to their significance as State-papers, by distinguished authors from both hemispheres: The Working Classes in Europe, by Thomas Hughes, M. P.; Labor in England, by Thomas Brassey; Grangerism, by Dr. Francis Wharton; The Grange and the Potter Law—Reply; the American Republic, by Gen. Francis Siegel; Indian Citizenship, by Gen. Francis A. Walker; The Chinese Question, by Dr. E. D. Mansfield; The Guarantee of Order and Republican Government in the States, by Judge T. M. Cooley; Some Checks and Balances in Government, by Judge T. M. Cooley; and Difficulties in Republicanism in Europe, by Edward A. Freeman, LL.D. This enumeration of subjects and authors is amply sufficient to commend the work to all political students—to all who would investigate the science of government with a view to a wise State policy rather than party success. A. S. Barnes & Co., New York.

The World's Fair, Philadelphia, 1876, by Francis A. Walker, Chief of the Bureau of Awards, is another of the specially meritorious republications from *The International*, by the Messrs. Barnes & Co., of abiding interest. It is an elegantly gotten up *résumé* of sixty-eight *International* pages, only; just enough to refreshen the memory of the hundreds of thousands of things seen there, and therefore valuable to every visitor.

The New England Journal of Education.—Among the awards of the Department of Education at the Paris Exposition is a bronze Medal to the *New England Journal of Education.* It is gratifying to note that the highest award given to the educational journalism of any country comes to our American publication.

Bibliotheca Medica.—A Catalogue of American and British Books, Periodicals, Transactions, etc., relating to Medicine, Surgery, Dentistry, Pharmacy, Chemistry, and kindred subjects; classified by subjects, with an index by authors, and price list. Price 25 cents. Cincinnati: Robert Clarke & Co.

Borax Soap, which is among the standing advertisements of THE SANITARIAN, is among the most useful of modern improvements on an essential article of cleanliness and health. Common soap is ordinarily made of refuse grease, scrap tallow, or stale and impure oils, and potash or soda; and—for the yellow kinds especially—resin is added to still further cheapen it. Such soap is frequently sticky, and sometimes irritating to the skin; and, in the laundry, not only requires very lavish use, but much labor in frequent rinsing to remove the stickiness and roughness common to clothing washed with it. To partially remove these objectionable features, all good washers are in the habit of adding a little borax. But *borax* soap—the substitution of borax and a little ammonia for soda or potash, and the use of *pure* tallow, in the making—wholly removes all such objections. This is not only superior in quality to soda and potash soaps, but in the long run more economical in both cost and labor.

Packer's Tar-Soap, which is also a standing advertisement in THE SANITARIAN, is a medicinal and nursery soap of great value—combining the recognized remedial qualities of *tar* with the detergent qualities of soap—admirably adapted to the treatment of various skin diseases and offensive cutaneous exhalations. For feet washing especially, and for the unpleasant body odors which are sometimes very troublesome to persons who perspire freely, and as a hospital and nursery soap, it is particularly commendable.

"Fire on the Hearth"—Open Stove Ventilating Co.—has been awarded the Silver Medal at the Paris Exposition for superior excellence as a warming apparatus.

Books Received: Dwight's Identification of the Human Skeleton; Report of United States Marine Hospital Service, 1876–1877; Royce Deterioration, and Race Education; Transactions of the Medical Association of Alabama.

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INUNCTION AND MANIPULATION.

By E. C. Angell, M.D.

"Aye, there's the rub."—*Hamlet.*

Anointing, or inunction, is one of the primitive processes of human luxury, invigoration, and refreshment. It was employed at so early an epoch that it is by no means easy to trace its origin in remote antiquity. Careful research, however, discovers evidence of this practice among almost all the ancient nations, although it is often impossible to determine the exact nature of the process, the character of the ointment, or even the precise object of its application. It is most reasonable to suppose, however, that the first employment of inunction arose from its distinctive sanitary benefits.

Among the Jews the act of anointing, as recorded in Scripture, was of the simplest character, and consisted usually in pouring oil upon the head from a horn or other receptacle, such as the alabaster box, broken that the precious ointment it contained might be poured upon the head of Christ, as He sat at meat in the house of the Pharisee. This form of anointing was customary as a mark of distinction, as in the case of kings and priests. Isaiah refers to oil as ointment in medical treatment, and anointing was prescribed for the sick by St. James. An oil-bath, according to Josephus, was one of the remedies employed in the case of Herod. The allusion in the Psalms to the ointment that ran down on Aaron's beard shows also that oil was used with a profusion doubtless pleasing to the recipient, but which would be far from gratifying to the average American or European of the nineteenth century. The anointing oil referred to in the Old Testament was often a very costly preparation. Olive oil, spikenard, and myrrh were the most common constituents. A very precious oil—the holy oil—was used in the service of the sanctuary, and could not be applied to any other purpose.

The Roman Catholic Church has retained inunction as a symbol in its sacraments of baptism, confirmation, ordination, and extreme unction. In consecrating a church the bishop anoints the walls of the edifice and the altars which are to serve in the celebration of the mass.

Inunction of the whole body was practised to some extent in Palestine, in connection with the bath; but among the Greeks and Romans, the two nations which, with the Jews, have impressed themselves most strongly upon the civilization of to-day, the process of inunction took a much wider range.

Aristotle recommends rubbing with oil as a remedy for weariness. Plato, in the Menexenus, makes Socrates speak of olive oil as an assuager of pain. Zenophon speaks of his soldiers as anointing themselves on a cold winter morning after sleeping all night in the snow.

The anointing of the Grecian athletes, as a preparation for the exercises of the gymnasium and the national games, was doubtless as thorough a rubbing as could well be administered, and its employment by those who made physical perfection the chief aim of their existence is ample proof that it was found beneficial, promoting at once suppleness and strength. It was customary to mix sand with the oil thus used, and after the contest the athlete was anointed again, with a view to restoring the tone of the strained muscles. So important was the anointing considered that special slaves, known as *aliptæ*, were set apart for this purpose.

Concerning this preliminary gymnastic rubbing—or *tripsis parakenastiki*, as it was called—Galen writes: "It is proper, by moderate rubbing with a linen cloth, to warm the whole body beforehand, and then to rub with oil. You will perceive a blooming redness running over the whole skin, and then is the time to apply the unguent, rubbing with bare hands, observing a medium hardness."

Of the after rubbing, or *apotherapia*, Galen says: "As it is applied with a large amount of oil, it at the same time moistens by means of the unguent, and softens the solid parts and carries off what is contained in the pores. Since the rubbing must be neither slow nor hard, we must pour oil frequently over the person to be rubbed, for this contributes both to the quickness and softness of the rubbing; and it enjoys also another very great advantage, for it relaxes tension and softens the parts which have suffered in the more violent kinds of exertion. The mean between soft and hard will be accomplished if the hands of the rubber be strongly imposed, so that their pressure approach near to hardness, but from the quantity of oil and the quickness of their movement fall short of it, for the unguent is no small protection against the powerful pressure of the hands."

That the custom of anointing, in connection with the bath, is of great antiquity, appears from Homer, who says in the Odyssey:

> "Sweet Polycaste took the pleasing toil
> To bathe the prince and pour the fragrant oil";

and again, in the Iliad, Juno anoints herself with "oil ambrosial sweet"; and Venus anoints the body of Hector with oil scented with roses.

But it was in the Roman baths of Agrippa, of Caracalla, of Constantine, of Diocletian, and Titus, and other emperors that the art of anointing was carried to its greatest perfection as a means alike

of pleasure and of health. It became of such importance that in all the great *Thermæ* a special room, known as the *unctuarium* or *eleothesium*, was provided merely for the keeping of the oils and perfumes. In an ancient painting, showing the apartments of a Roman bath, the *unctuarium* appears like an apothecary's shop, filled with an immense number of vases. So essential did the Roman bathers consider the process of anointing, that they indulged in it twice in each bath, at the beginning, when a comparatively cheap oil was employed, probably without perfume, and again at the close, when costly balsams and fine perfumes were used without stint, being rubbed over the entire body, even to the soles of the feet. The variety of these ointments was very great—cloves, cinnamon, lilies, lavender, myrrh, roses, and many other fragrant substances being used in their manufacture. It was even customary to apply different unguents to different parts of the body during the same bath; oil of wild thyme being rubbed on the head, neck, and eyebrows, and oil of watermint on the arms. The rich had precious ointments of their own, which were carried to the baths in small vials of alabaster, crystal, or gold. The use of these unguents required the services of many attendants, a point concerning which Spartianus tells an amusing story. The Roman Emperor, Hadrian, seeing a veteran soldier one day rubbing himself against the marble at the public baths, asked him why he did so. The veteran answered, "I have no slave to rub me;" whereupon the Emperor gave him two slaves and sufficient to maintain them. Another day several old men rubbed themselves against the wall in the Emperor's presence, hoping for similar good fortune, when the shrewd Hadrian, perceiving their object, directed them to rub one another.

The luxury of the anointing process, as practised by the Roman bathers, is well set forth in Bulwer's ingenious romance, "The Last Days of Pompeii," which was written during a residence at Naples, with frequent visits to the baths he describes. Glaucus and Lepidus, two of the personages of the story, after their progress through the bath, meet at last in the *tepidarium*, or warm-air chamber, where, says the author:

"Now the main delight and extravagance of the bath commenced. Their slaves anointed the bathers from the vials of gold, of alabaster, or of crystal, studded with profusest gems, and containing the rarest unguents gathered from all quarters of the world. The number of these smegmata used by the wealthy would fill a modern volume—*Amoracinum*, *Megalium*, *Nardum*—*omne quod exit in um*—while soft music played in an adjacent chamber, and such as used the bath in moderation, refreshed and restored by the grateful ceremony, conversed with all the zest and freshness of rejuvenated life."

It must not be supposed, however, that the anointing process was by any means confined to those who bathed in a state of health. Galen, in his tenth book, in describing the treatment of a case of marasmus by means of the bath, explicitly directs that the patient be carried into the *tepidarium*, where his whole body must be anointed with oil. Celsus also, in prescribing bathing for those who suffer from affections of the head, not only directs a preliminary anoint-

ing, but also says that at the conclusion of the bath the head ought to be rubbed for some time, afterwards dried, and then anointed anew.

Among the ancients Celsus enjoys the distinction of being the particular advocate of inunction, which he recommended in a great variety of cases. He was also a believer in the virtues of simple friction. He remarks, however, that "there is a wide distinction between anointing and rubbing, for even in acute and recent diseases the body ought to be anointed." In feeble persons, he observes, exercise should be followed by anointing either in the sun or before the fire, sometimes by the bath. "If one be harassed by febrile sweatings, the skin should be hardened by nitre or salt mixed with oil; if the malady is slight, the body should be anointed with oil; if more severe, with rose ointment, or quince or myrtle oil, to which astringent wine has been added." In chilliness before fevers Celsus advises rubbing with hands smeared with old oil, to which some warming substance has been added. If, nevertheless, shivering should occur, he directs pouring between the cloths themselves a large quantity of warm oil, and then rubbing the patient as much as he can bear.

In epilepsy Celsus recommends that, on rising, "the body, except the head and abdomen, be gently soothed by friction with old oil; in atrophy the patient should be anointed often on the same day, both before and after food; in pleurisy it will not be wrong to rub the extremities with oil and sulphur; in cholera, if the extreme parts of the body are cold, they are to be anointed with warm oil; in gout gentle inunctions are to be employed, and the joints rubbed with a healing ointment; in tardy convalescence, from whatever disease, let the patient wake early but stay in bed, and about the third hour gently soothe his body with oiled hands."

He attaches great importance to inunction in tetanus, and says it is necessary to bring the invalid before the fire, or, if it be summer, into the sun, and rub the neck and shoulder-blades and spine with (what is best) old oil; if that be not at hand, with Syrian oil. Friction, he adds, although useful to all the vertebræ in man, is particularly so to the vertebræ of the neck. Therefore this remedy, with the interposition of certain intervals, must be used day and night.

Frequent allusion is made to anointing in Cameron's "Baths of the Romans," which was published over a hundred years ago, and in more modern times Dr. Schneeman, Physician to the King of Hanover, enjoys the distinction of having reëstablished inunction in the treatment of fevers.

Shortly subsequent to these observations Dr. William Taylor, surgeon to the Clerkenwell Infirmary, London, published a small volume, entitled "A New and Successful Treatment of Febrile and Other Diseases, through the Medium of the Cutaneous Surface. Illustrated with Cases." This book appears to be rare, the only copy I have seen having been kindly lent to me by Dr. Otis, and some citations from it, I apprehend, may prove as novel as they are interesting. Additional weight may be given to this work by reason of the marked caution of the author, and his reluctance to lay his method of treatment before the public until its good effects had been demonstrated by long experience. Their importance may be

judged from Dr. Taylor's statement that, during the twelve years from 1837 to 1849, between 200 and 300 cases of fever occurred at the Clerkenwell Infirmary, without a single death in idiopathic cases; whereas in 1836, before his plan of treatment was adopted, twelve patients died of typhus in one month. As early as 1829, Dr. Taylor observed that fever frequently disappeared in cases where workhouse patients also suffering from *scabies* were treated for the latter disease with the warm bath and the compound sulphur ointment. An alterative with saline medicine administered in these cases had the credit of curing the fever, but at length recovery took place in a case where no medicine had been given, and the inunction fixed his attention and led to a series of experiments in the hot stage of fever, with various simple ointments, from which he concluded that lard was the ingredient chiefly worthy of notice. After still further trial with oil, wax, and other substances, he eventually mixed lard and suet in equal proportions, and melted them carefully over a slow fire, and the combination, having acquired about the consistency of common tallow, was found to answer every requisite. This came to be known in Dr. Taylor's practice as "hard ointment," and its application was found highly beneficial in common inflammatory fever, typhus, scarlatina, measles, dropsy, phthisis, insanity, delirium tremens, and hydrocephalus. A multitude of successful cases occurred which it was impossible to record at length in a small volume of 170 pages, but those which are given afford ample illustration of the benefit of a judicious and thorough treatment of the skin in febrile and other morbid conditions. Dr. Taylor did not rely entirely upon the "hard ointment," but also employed other remedies to act upon the internal organs, although in one striking case of typhus, that of Ann Binham, age twenty-three, the patient obstinately refused to take medicine, and yet recovered from a severe attack in twelve days by inunction alone.

With reference to the time and mode of applying the ointment, Dr. Taylor says:

"I have found that it should be rubbed in night and morning, and more frequently in urgent cases, in every part of the skin which is hot and dry. It should be done freely, but gently, during from half an hour to an hour at a time—indeed, until the skin is saturated, when from being harsh, hot, and dry, like washed leather, it becomes soft, and yields for the most part, after a few applications, the feeling of velvet. When the skin is in the dry and harsh state of fever it is astonishing how large a quantity of the ointment must be rubbed in before the skin is saturated; but so soon as the latter becomes cool and soft, comfort ensues, and the patient is placed in a vastly improved condition; but dry rubbing does not soften the skin and produce the same free and healthy action.

"When the ointment has been well rubbed in, the countenance indicates its good effect in a surprising manner, and the unctuous friction is superior to the cold or vapor bath, especially in this respect, that with the ointment the object in view is at once attained, the result permanent, and no danger incurred."

Concerning the precise action of fever upon the skin, Dr. Taylor says:

"When fever has set in, the skin, which is naturally highly vascular, and abundantly supplied with nerves, is thrown into a morbid state; it becomes sensitive to change of temperature, and to the touch; it is dry, harsh, and hot; the pores and exhalent vessels become obstructed; the sebaceous glands cease to perform their function; the whole cutaneous surface is parched, dry, and contracted, much resembling chamois leather, and has lost a portion of its vitality. Such a condition of the cuticle is exceedingly obstinate and very difficult to remove, whilst the method of treatment usually adopted is tedious, and requires much time and diligent perseverance. Medicine introduced into the stomach must be continued a long while, and is very slow in restoring the functions of the skin; yet very readily is this state of the skin completely changed by a few applications of the hard ointment, and all symptoms depending on that state are removed at the same time."

The advantages of inunction in febrile conditions Dr. Taylor states as follows:

"Its use extends to all inflammatory, typhoid, and scarlet fevers, measles, and every instance of acute inflammation where there is much heat and dryness of the surface. Fever assuming all the typhoid symptoms will be found to change its character completely under this treatment in twenty-four hours. It especially soothes the nervous system, procures sleep, lessens the frequency of the pulse, allays the heat of the skin, and correspondingly the thirst. The pulse may be reduced from 120 to 90 in a few hours after a few applications of the ointment. It corrects the fetid and offensive odor arising from patients; contagion seldom spreads after its use, very rarely even in crowded rooms. When early employed the fever is prevented from running into the continued type, and the patient soon becomes convalescent. Finally, it should be observed that it is always at command, perfectly safe, harmless, and is, perhaps, never contraindicated."

In dropsy of the febrile or inflammatory form, Dr. Taylor found that inunction produced the most favorable results, even in cases treated unavailingly by eminent physicians; and the good effects of this peculiar method were equally striking in cases of hydrocephalus, the improved action of the skin serving effectually to remove the watery accumulations caused by these diseases.

Of inunction in phthisis, Dr. Taylor says:

"I have seen great benefit derived from it in incipient cases, as well as in other pulmonary complaints. In acute bronchitis, attended with a hot skin and great expectoration, I have witnessed the greatest benefit, and have known the expectoration to be reduced from a pint in twenty-four hours to three or four ounces, in the course of a few days."

In 1830, Esther Cook, aged thirty-seven, a confirmed lunatic, was admitted to the Clerkenwell Infirmary, and treated for *scabies* with the usual sulphur ointment. After two or three weeks of rubbing in, her intellect was found to be restored, a fact which led Dr. Taylor to employ the hard ointment in treating cases of mild insanity. The result showed in a surprising manner the sympathy existing between the skin and the brain, and the beneficial effects of inunction

upon morbid cerebral conditions, not only in ordinary mania, but also in delirium tremens.

Dr. Taylor's faith in inunction was thoroughly tested in his own case by a severe attack of typhus, which he cured by the free application of the hard ointment to the skin, to the exclusion of other medication, a result which naturally confirmed his confidence in the system.

About the time of the publication of Dr. Taylor's book in London the same practice was strongly advocated by Dr. Lindsly, of Washington.

Dr. John Hughes Bennett, who introduced cod-liver oil into British medical practice as a remedy for pulmonary consumption, declared in the Edinburgh *Medical Journal* for April, 1853, that there is every reason to believe that inunction is very beneficial. In this way the fatty matter is introduced into the lymphatics, and serves to elaborate blood through the agency of the mesenteric glands.

Dr. H. W. Fuller, in his valuable work on "Diseases of the Chest," after referring to inunction among the ancients, says:

"It is in constant use in the present day among the natives of Western Africa, who suffer little from the ravages of phthisis. Even in our own country accidental inunction takes place to a limited extent in certain classes of the community. Persons engaged in wool factories, where large quantities of oil are employed, tallow-chandlers, butchers, and others, are necessarily in contact with fatty matter throughout the day, and it has been observed not only that they are usually well nourished, but that they are less liable than others to suffer from consumption. But more than this—experience has established the fact that the endermic method of introducing the oil is often very serviceable in phthisis. Cases have been published by Dr. Simpson, of Edinburgh, and other observers, which are quite sufficient to prove its efficacy, and in my own practice several instances have occurred in which its operation has been signally beneficial. One gentleman whom I saw in consultation gained a stone and a half in weight in less than three months by the persevering use of it, and the physical signs of pulmonary disease subsided greatly at the same time."

A curious illustration of the value of inunction is given by Dr. Erasmus Wilson, who says:

"We all know that there is nothing more painful than a sprain of an ankle; it will lay a man up longer than the fracture of a bone, and he may recover with a very weakened joint. Accompanying a country medical man in his rounds, he told me he had made a great discovery in the treatment of sprains. 'The way I cure a sprain,' he said, 'is this: I take some lard; I warm it, and rub it into the sprain half or three quarters of an hour. I then take some cotton wool and wrap around the joint and put on a light bandage. The sprain, which would have taken many months to get well, gets well in a few days—certainly in a few weeks—without any ill effects or after consequences.'" Wilson adds: "I tried this treatment and found that it succeeded admirably." In erysipelas the same writer recommends inunction as superior to water applications; first, however, relaxing the skin with hot water or

steam, then saturating it with hot oil, and covering it entirely with wool.

Striking testimony as to the value of inunction is borne by Dr. Thomas Inman, of London, in the chapter on "Oil-Rubbing," contained in his entertaining volume of essays "On the Restoration of Health." Dr. Inman traces the use of oil, as applied to the skin by orthodox practitioners in modern times, to the period when "the medical profession went wild upon the importance of cod-liver oil," and had it rubbed in in cases where it was rejected by imperious stomachs. When this was abandoned because of the vile odor of the fish-oil, some few investigated further to see whether other substances were not equally valuable. "Scented lard, pure salad or olive oil, almond, and other oils were tried in succession; and it became evident that advantageous results followed in many cases of consumption"; that where there was debility as a prominent symptom the experiment "was attended with successful results," and that "the use of oils over the body is appropriate in fevers and in all cases where the surface is unusually dry and harsh."

Dr. Inman further says of inunction: "The practice may be usefully adapted in those cases where infantile convulsions occur and are imminent, whenever children's flesh is soft and flabby; when water in the head is threatened, and when cramps are common. It is very useful, indeed indispensable, in bronchitis, phthisis, mesenteric disease, marasmus, diabetes, and myalgia. Appropriately used it becomes an aphrodisiac. The plan may be varied by medicating the oil with such stimulants as turpentine or other essence, or with a narcotic, such as belladonna, opium, or morphine."

As to the method of inunction, Dr. Inman observes: "Oil-rubbing requires some nicety in manipulation. As a general rule it is useless for a patient to rub himself. As a general rule ing the process does away with any good it can effect. The rubbing should be carried on in a warm room, and care should be taken to suit the pressure of the hand to the comfort of the sufferer. Sometimes the patient is too weak to endure it. Under such circumstances an oiled pad may be placed on the chest or elsewhere."

In illustration of the benefits of inunction, Dr. Inman cites the following marked cases:

"It would fill a moderate sized volume were we to enumerate the instances in which we have seen a beneficial effect from oil-rubbing ——a result which has been tested in every possible way; but we will content ourselves with one or two. A gentleman of almost Herculean build had long been a sufferer from that form of debility called 'nervous.' Everything which medication could do was tried; there is not a known tonic which was not used, nor a *roberant* diet which was not rigidly followed up. Yet the improvement was almost imperceptible from month to month. At length resort was had to shampooing with oil, and a change for the better was soon apparent. For many weeks the practice was continued, and new e seemed to be infused into the system. Then the plan was opped, and the patient drooped. The practice being again adopt- was not given up until the gentleman had regained perfect health. is indeed a client of whom a physician may well feel proud.

"A young lady of slender build and great activity, having parents both delicate, if not consumptive, after leaving school began to suffer from various pains, and her life was made almost miserable by aching limbs and tortured body. Tonics of all kinds were prescribed, exercise was enforced, the diet was of the best, yet still the lady lingered on in suffering. At length it was ascertained that the case was one of simple myalgia; every muscle of the body was soft, flabby, ill nourished, and unfit for work, and, as a consequence, all were seats of pain after very trifling exertion. Rest in bed was recognized as the appropriate cure, but there was little increment of strength, and perpetual imprisonment in a four-poster seemed threatened. At this juncture shampooing the limbs with oil was adopted, and recovery shortly began. The mother, doubtful of the efficacy of the plan, reported that it made the legs swell. And so it did indeed, but only in the way a famine-stricken sailor swells when he reaches a land of plenty. The lady continued to increase in the way indicated, until she was enabled to take leave of the doctors and the rubbing, and to become an ordinary woman, useful, ornamental, and comfortable."

Dr. Inman also mentions another case, even more remarkable, in which he advised oil-rubbing to smooth the passage to the grave of a young man, whose physicians all regarded him as doomed to a speedy death from consumption. Three years later Dr. Inman met the young man's family doctor and asked if he remembered the case. "Yes, distinctly." "How did it end?" "Why, I met him at a ball last night, and he was the handsomest man in the room," replied the other.

In summing up, Dr. Inman says: "Though I speak enthusiastically of oil-rubbing, my readers must not imagine that it is a panacea or *elixir vitæ*. By no means; it is simply a valuable—very valuable—addition to the physician's armory."

In conclusion, he repeats his favorite formula for cases of general debility: "Keep the stomach for food, the rectum for physic, and the skin for oil."

Although inunction has been practised in this country to a considerable extent, very little seems to have been written upon the subject. The late Dr. John Bell, in his able and exhaustive work on baths, refers to anointing as follows:

"Although we can hardly expect to see a renewal of the practice of inunction, either after the bath or between its stages, to the same extent as in ancient times, yet certainly in many cases it might advantageously be revived, both as a part of medical treatment and as a means of protection against great and sudden exposures to extremes of temperature."

Dr. Wm. R. Fisher published a paper on medical inunction, in 1875, with several cases of unusual interest. A child of four months, almost *in articulo mortis* with cholera infantum, and given up by the family physician after thorough treatment according to the approved methods, was saved by hourly inunctions from head to foot with warm sweet oil. "After each application," says Dr. Fisher, "it seemed to be more and more soothed and strengthened. The vomiting ceased; the passages from the bowels improved in color and

consistency, and diminished in number." The child recovered entirely, owing its life, without doubt, to the use of oil by inunction. In another case, a child of the same age, an obstinate intestinal disorder, which had defied internal medication for months, yielded in a week to inunction with sweet-oil applied every night. Dr. Fisher further says:

"In acute inflammation of the lungs, pleura, and bronchial tubes, I have several times seen most excellent effects follow from the use of inunctions. In the lobular pneumonia of children there is no remedy with which I am acquainted that will so speedily induce sleep, relieve distress, and put a stop to the short moaning cry as warm sweet-oil frequently applied to the whole body. Inunction is likewise of great benefit oftentimes in chronic diseases of the lungs, phthisis, chronic pneumonia, bronchitis, and emphysema."

Dr. W. H. Thompson, in the same year, in the course of his lectures in the Medical Department of the New York University, refers to this topic as follows:

"A measure which I adopt in every case of severe fever of any type, but notably in the exanthemata, is general inunction of the body several times a day either with simple olive oil or with equal parts of olive oil and lime-water. This is one of the oldest means of therapeutics, and the longer I employ it the more I am satisfied that it confers several peculiar and positive benefits, but notably in those complaints in which the skin becomes severely inflamed, as in scarlatina and small-pox. Its advantages in other fevers are not slight. It greatly allays the irritability of the surface nerves, which is a source of restlessness and shifting of the position in fevers. It calms the nervous centres when disturbed by a too constant transmission of external impressions by the excited peripheral nerves, and hence is no mean adjuvant toward procuring sleep. By relieving the tension of the skin also, it disposes to a gentle perspiration, and to that fact I attribute the still further advantage which is often undoubtedly gained by it—namely, of lowering the temperature of the body. You will frequently note a fall of from half a degree to a full degree in the thermometer under the tongue half an hour after a general oiling, and which, therefore, cannot be ascribed to a mere cooling of the surface by exposure. Another effect which I have noticed is that it relieves thirst, which I would ascribe to its restoring a function of the skin, which enables it to add water to the system when needed, as well as to abstract it when the circulation is too full; and the arrest of which function I regard to be the cause of the thirst always present when the skin is rendered dry either by fever or the tension of general anasarca. In every case of typhoid, therefore, I direct that the patient be rubbed with oil by the palms of the hands three times a day, and oftener if there be great restlessness or the skin be very hot. The attendants very soon perceive the use of persevering in the applications on noting the patient often coming out of his delirium during its performance. By this means also the vitality of the skin is maintained in those parts where you are liable to have bed-sores, so that you will rarely be troubled with this unpleasant complication."

As much of the benefit of anointing has resulted from the em-

ployment of animal as well as vegetable oils, we may readily infer that the beneficial effects arise from the oleaginous quality of the oil or ointment, and from the rubbing rather than from any special therapeutic property such as is generally supposed to belong to cod-liver oil. This inference, if just, is of much importance, for it leaves us at liberty, in establishing a scientific system of sanitary or medical inunction, to choose those unguents which are the most easily preserved pure, which are the most readily absorbed, which are the most easily introduced, which are the most soothing to the skin, most pleasant to the sense of smell, and, in a word, most agreeable to the person anointed, whether in health or disease.

We come next to the reasons why inunction, notwithstanding its great demonstrated advantages, and notwithstanding its once almost universal use by the conquerors of the world, is now so neglected and so little esteemed by the profession and the public. One of the best modern works on electricity contains this suggestive remark: "There is little doubt that if electricity could be given in the form of pills or powders as successfully as it is now employed, its use would be increased one thousand-fold." There is in my opinion as little doubt that if a dose of inunction could be taken as quickly and as easily as a capsule or a lozenge, "oleaginization" would speedily rank with the use of electricity and ether, opium and quinine, as a standard resource in therapeutics.

Such a ready administration of inunction is of course an impossibility. Effective anointing must always and inevitably consume a certain amount of time, which will cause hesitation on the part of patients of industrious habits who are not too ill to move about and attend to business. The only way to obviate in any considerable degree this impediment in the way of popularizing hygienic inunction is to make the process so agreeable that it will be found an enjoyment instead of a hardship.

To accomplish this, two things are necessary. These are: *first*, the employment of satisfactory unguents; and *second*, the employment of competent anointers.

Satisfactory unguents must be pleasant or at least inoffensive to the smell; they must not be either gummy or sticky, and must leave no trace of oil upon the skin after the conclusion of the process. They should also possess properties which will prevent decomposition by the warmth of the body, that they may not become offensive.

The second requisite, a competent anointer, is even more essential and more difficult to secure. Dr. Taylor remarks especially upon the trouble he experienced in finding persons strong enough and patient enough to apply his hard ointment successfully; and when besides strength and patience we require skill enough to make the process a pleasure, we shall not be surprised if we find competent anointers few and far between. Men who are properly trained as rubbers or shampooers in the best bathing establishments are best calculated to supply this want, and to them we may look not in vain for competent anointers. Their labor alone in friction, in massage and manipulation, in percussion, often serves an important remedial purpose in rheumatism, paralysis, and other diseases;

and when to the advantages of dry rubbing the benefits of a proper unguent are added, it is plain that a hygienic combination of no small efficacy is formed.

Dr. S. Weir Mitchell, in his work entitled "Injuries of Nerves," speaks of the value of massage or manipulation as follows: "In the treatment of all forms of traumatic, and, indeed, of some other palsies, the value of massage is very great, and the results which I have seen obtained by practical rubbers were certainly to be gained by no other equally rapid treatment." In the treatment of paralyzed limbs he remarks: "I prefer also that every massage should be preceded by a local hot bath. The skin under this usage seems to become thinner, more pliable, and less bound down to the parts beneath it, while the increase of tone in every muscle is most remarkable."

Dr. Meredith Clymer speaks of the treatment of nervous affections as follows: "A notable proportion of the chronic disorders of the nervous system are functional, the result of brain fag and irregular habits. Circulation, digestion, and muscular action have become equally implicated. There is lessened activity and loss of tone, and a dry, harsh, inactive skin is a constant condition. It is one of the chief indications to restore the activity of the vaso-motor centre and equalize the circulation. To effect this I have found the hot-air bath one of the most available aids. And, advantageous as it has generally proved, the benefits are more than doubled when succeeded by the system of anointing and massage which has come to be known when supplementing the application of hot air as forming the concluding stage of the complete Roman bath. The stimulation of the cutaneous nerves by this means seems to quicken vital action and secures a proper distribution of the blood, thus dissipating and hindering congestions."

Dr. Douglass Graham, in a paper published in the *Medical Record* a few months since, gives an account of upwards of 300 cases of sprains which were rapidly and successfully restored by massage.

The most modern and the most model treatment of a sprain perhaps was recently advised by Dr. W. H. Van Buren. The case reached him after having been treated for a considerable period with the usual course of splints and bandages with little progress towards recovery. The hot-air bath was employed daily, and at its conclusion the wrist was submitted to the hot douch, and this was followed with thorough searching massage, with profuse lubrication with oil, not of the hand and arm merely, but of the entire body. The hot douch and massage was applied the second time, each day without hot air. It was a sprain of unusual severity—the median nerve having been somewhat injured. At the end of ten days, however, the wrist was well enough to do good service at polo, by which means it became originally disabled.

In regard to manipulators or rubbers, they should be athletic, honest, intelligent, industrious, and strictly temperate. If they are saturated with beer, tobacco, or whisky, they will poison the air and the patient, and will do more to induce disease than to effect its removal. There should be strength as well as delicacy of touch,

both of which come only from much practice. There should be at least some general anatomical knowledge of the structure upon which the skill is to be employed. It is only by intelligent direction and by untiring labor that the true *taxis eruditus*—the learned touch—can be acquired.

It was declared by Hippocrates that "by vigorous rubbing the body is hardened; by gentle rubbing, softened; by prolonged rubbing, reduced; and by moderate rubbing, increased." Some attribute the benefits of anointing mainly to the oil, and others mainly to the rubbing. The truth is, both play an important part, and each assists the other. Without rubbing, the unguent would necessarily be imperfectly absorbed, and much of its possible effectiveness would consequently be lost; the pores would be covered, the clothing smeared, and the patient disgusted. Without lubrication, thorough searching manipulation is rendered practically impossible, from the tendency of dry rubbing to chafe, excoriate, and irritate the skin to an extent often that proves a source of torture.

That the rubbing in of the ointment is a highly beneficial part of the process of inunction, and that its skilful performance is essential to the highest success of that process, I have no doubt; but I am equally certain that in many cases it is the oil directly that accomplishes the greater part of the resulting benefit.

Anointing associated with massage not only increases nutrition, it also increases the activity of the skin, while at the same time it has a tendency to repress undue perspiration. Its tendency is therefore largely to promote strength.

In the wide variety of conditions in which inunction is clearly indicated the aim is generally to effect one or more of the following results:

1. To strengthen weak lungs, as when bronchitis or pneumonia is threatened, or either has been successfully combated, in which event inunction should be followed up daily until the case has been conducted through convalesence to complete restoration. Its value in cases of this character does not admit of question. As early a writer as Pliny says that olive-oil is good to warm the body and fortify it against cold. The traveller Galton verified this in his own experience, and it was a knowledge of the warming qualities of inunction that enabled Webb to perform the unparalleled feat of swimming the English Channel, the unguent used in his case being the oil of the porpoise. Many a sufferer whose sensitive organization makes him shrink and shiver at the thought of winter long before its approach, might by judicious and persistent inunction escape the expensive and hateful necessity of abandoning home, business, and friends every winter for an enforced sojourn in a Southern climate. We can produce examples of this class, who, for the winter and spring months, by frequent recourse to inunction, have not only escaped colds, but have found positive pleasure and recuperation in the Arctic weather itself, which they had hitherto so much dreaded.

2. To remove debility of whatever form arising from impaired nutrition. Under this head marches the great army of dyspeptics, who will find meat and drink, weight and strength, in inunction.

The cases cited from Dr. Fisher's paper illustrate the remedial effects of inunction upon the worst disorders of the digestive system. According to my own observation, improvement in digestion and increase of weight have been the ordinary results of frequent inunction. In one marked case, that of a young man greatly run down by overwork of the brain, twelve pounds was gained in three weeks by inunction on alternate days, after the failure of a three months' trial of other means of recruiting. Another young man, suffering from dyspepsia, severe constipation, some fever, and great depression of spirits, was treated with daily inunction for nine successive days, and gained in that time seven and one half pounds, entirely recovered his spirits, and was made practically well in every respect. Ordinary medication tried in his case had not helped him at all.

3. To allay insomnia, hysteria, and incipient insanity. Dr. Fisher mentions a diminution of nervous irritation as one of the effects of inunction; and its sedative influence upon excitement, whether febrile or nervous, was very marked in Dr. Taylor's practice. I have often seen patients drowse under the process; and cases have occurred in protracted insomnia, when sleep had proved impossible for several successive days and nights, despite medication, where the process of inunction before completion has left them in a profound sleep, which has usually been uninterrupted until the morning hours were well advanced, when the sufferer has awakened practically to new life.

4. To relieve rheumatism and paralysis. In these cases the rubbing is probably the major factor of the result, being greatly facilitated, however, by the unguent, which doubtless directly as well as indirectly in some degree enhances the benefits.

5. To abort fevers. The efficacy of inunction in breaking up fever after it was fully established, as recorded by Dr. Taylor, seems to indicate clearly the wisdom of employing it to avert febrile attacks before they are completely developed.

6. To guard against contagion. In the treatment of the plague inunction was found to be not only the best remedy in the cure of the disease, but the best protection against its spread, none of those engaged in anointing having ever been known to contract the malady. In many cases where physicians and others are exposed to infection, or are particularly liable to it, regular inunction during such exposure, or until the susceptibility is overcome, would doubtless be a prophylactic measure of great value. It is my impression that a system of hot-air disinfection, supplemented with anointing, would have contributed largely to diminish the plague in our sadly scourged Southern cities.

An objection which is sometimes brought against inunction deserves brief mention. This is the argument that the process must choke the pores, and thus impede the functional activity of the skin —certainly a very undesirable result. Dr. Taylor and others who have practised inunction largely have observed no evidence of such obstruction, but rather a marked improvement in the skin's action; and I am satisfied that perspiration is more facilitated than hindered by thorough rubbing with any smooth, fine, pure unguent. By such

rubbing the particles or minute globules of oil are forced through the epidermis, and brought in contact with the lymphatics and blood-vessels of the cutis vera, by which they are taken up and conveyed into the circulation. Without friction the chief part of the unguent would remain upon the skin, a small portion being probably drawn, by endosmosis, through the cuticle. The remainder would cover the surface, and would of course more or less effectually check perspiration in the skin beneath. With thorough rubbing, however, the unguent is forced through the epidermis and carried off, so that nothing is left to clog the sudoriferous ducts. The idea that these ducts absorb the oil and thus become choked is of course idle, their function being purely excretory; and the notion that the oil is rubbed in through them is equally groundless, as may be seen from the fact that it is much easier to rub oil through the thin epidermis of the back, with its less than 500 pores to the square inch, than through the thick epidermis of the palm of the hand, with its 2,800 pores to the same area. Further than this, that the action of the skin is not checked is made doubly sure by the very practical fact that when one arm or one leg is anointed with thorough rubbing, and the other is left without oil, the anointed limb will perspire in hot air as soon and as freely as the anointed one, and in most cases sooner and more copiously.

A further evidence that anointing does not impede the activity of the skin has been repeatedly furnished in cases of general ansarca in Bright's disease, in intermittent fever as well as in exema and soriasis. In fact, in all cases in which the skin is dry and inert, a preliminary inunction before the introduction of the patient to the hot-air chambers has invariably been found to greatly facilitate the activity of the skin; and in cases of this character anointing should always precede as well as succeed the employment of the hot-air bath; and here it may be remarked that the opportunity most favorable for the employment of general inunction is directly after the application of hot air. The skin is then in the best possible condition to receive the unguent, and the very best result may confidently be expected. Another favorable opportunity is found in direct exposure to the rays of the sun.* Here it is of the utmost utility, as it not only protects the skin from burning, but is often absorbed in larger amount, much to the general advantage of the bather. It has also proved highly advantageous as supplementing electric baths, and the popular notion that some rubbers impart more or less of the electric element doubtless has some foundation in fact.

The history of anointing seems to point to olive oil as the unguent in chief, not only in ancient but in modern times. Dr. Fisher strongly recommends it, and there are no doubt good and sufficient reasons why a vegetable oil may, for the general purposes of inunction, be superior to any other product, and eminently, perhaps preëminently so, when nutrition is sought to be effected or enhanced by this measure, more especially as all nutrition is of vegetable origin. For myself I am as strongly in favor of vegetable oil as

* Sunlight and Solarization: THE SANITARIAN, current series, p. 433, *et seq.*

any one, and after experimenting considerably with oils, have finally settled upon a product which I think, taken all in all, possesses more of the requisites of a perfect unguent than I have found in any other substance. It enters largely into commerce, and in its crude condition is extensively employed as a lubricating oil for machinery.

It is common to most tropical countries, and is produced by a variety of the palm species, and is known as the kokos or cocoanut tree. In its crude commercial condition it possesses rather an unpleasant odor—a fact which detracts from the value of the substance. The better qualities of the oil, however, treated with animal charcoal or boneblack, may be completely deodorized. This clarified oil in a fluid state is as clear as water and about as odorless, and is easily and readily absorbed in much larger amount than any other emolient with which I have become acquainted; and I am not alone in this conviction. As recorded in the United States Dispensatory, Dr. Theophilus Thompson found this oil to possess all the advantages in consumption of cod-liver oil, with the additional advantage of being much more agreeable, with the entire absence of nauseating tendencies. Dr. J. H. Warren, of Boston, gives similar testimony in its favor. In Germany it has been used in pharmacy to a considerable extent as a substitute for lard. Dr. Petterkoffer regards it as preferable to the latter substance, as less liable to become rancid, and also on account of its more ready absorption when rubbed on the surface of the body, and its less liability to produce chemical changes in substances with which it may be associated. For example, the ointment of the iodide of potassium, when made with lard, becomes yellow in a few days; when made with cocoanut oil it remains unchanged for months. Dr. S. Weir Mitchell, who strongly advocates massage in his work entitled "Fat and Blood," speaks of this oil as follows: "It is agreeable in odor and keeps well in warm weather; is a good lubricant, and keeps the skin soft, smooth, and supple." As clarified, deodorized, and refined, it has received the name of *Kokoleon*.

There are three products of petroleum which have been employed quite extensively in the last few years as emollients or lubricators, while they have been used more or less in pharmacy as a base for various ointments. I refer to Cosmoline, to Vassaline, and to Romaleon. The latter was originally, and has continued to be, prepared at my instance, for the purpose of anointing, and is especially suited to a large number of cases.

When reduction of weight is sought to be effected, when lubrication without absorption is desired, and when dandruff or scaly eruptions, as in exema or soriasis, are sought to be removed, it possesses advantages which I think are unequalled. For the general as well as many of the specific purposes of anointing, Kokoleon or Romaleon, both of which are usually perfumed in a manner which does not detract from their usefulness, or they are used plain when preferred, will, I think, be found to possess all the advantages, and to confer all the benefits that can reasonably be expected from the very choicest products. Excellent, however, as are these preparations, I am not so dazzled by their good qualities, that I would not

welcome a better. And there is no good reason why our unguents should not become as numerous as those of the Romans, for I am convinced that oleaginization has an auspicious future, and will command the respectful attention of every enlightened physician. Anointing, associated with artistic massage, manipulation, percussion, rubbing, and shampooing—especially when these measures supplemented hot-air electric baths, or exposure to the sun, whether in physical training or in treatment of disease—will confer benefits which have hitherto been believed impossible. In walking, in wrestling, in rowing, in running, in fact in all the purposes of physical training, these allied agents open up a new vista of possibilities which are as gratifying to contemplate as they are impossible to compute. As an evidence of the estimation entertained of this lost art of the Cæsars—this restored luxury of the Romans—the significant fact that it is less than four years since its restoration as one of the processes of the bath, yet in the house of its new birth nearly 10,000 anointings have been administered. A considerable percentage have been given to physicians; many have been taken by the advice of physicians; many in health have sought its luxurious benefits as a means of muscular development.

For those whose business subjects them to sedentary confinement this is the greatest boon of modern times. Many acute sufferers from the host of recurring maladies have found speedy relief, and many chronic invalids, in whom despair had dispelled hope, have awakened to new life.

The advantages are so evident—so unmistakable—that a single example rarely fails to convince the most prejudiced and sceptical who will try the test of a single application that the Romans were not blockheads, and that a good thing of the past has come to us with more than prestine benefits.

In the treatment of disease by the associated measures of anointing, of hot air, and of massage, which comprehend the complete Roman bath, a recent neuralgia or a recent rheumatism has often been dispelled in a single hour, and an acute lumbago or sciatica has been as effectually dissipated in a single day.

In addition to the prophylactic properties of these conjoined benefits, they afford the most agreeable, the most economic, the most speedy transition from misery to mirth, from pain to pleasure, from disease to deliverance. It is, in brief, medication made no less effective than gratefully luxurious.

Lactopeptine.—In the summer diarrhœas of children we have found lactopeptine of the very highest value. It is probable that the weakening of the digestive powers is a very important factor in the causation of cholera infantum. We have found lactopeptine a most important help in restoring these cases when they have passed through the worst stages of that disease, as well as in warding it off when its onset seemed almost inevitable. . . . In the nausea and indigestion, and in the cardialgia which cause so much annoyance in the later months of gestation, lactopeptine has proved itself almost a specific.—*St. Louis Clinical Record.*

HYGIENE AND THERAPEUTICS.*

By J. R. Black, M.D.

A pathological therapeutist is very apt to treat a chronic intermittent thus: A mercurial cathartic to clean out the abdominal viscera, then quinine in large doses, and if this does not succeed, then in larger and yet larger, to destroy or neutralize the hypothetical malaria in the system. Cases have I seen by the score who had received such treatment for weeks and months unavailingly, who had taken quinine and iron until they were, as they expressed it, almost blind and deaf, and yet the disease persisted, with very brief cessations. As a hygienic therapeutist, and as one who has had a large experience with chronic intermittents, I unhesitatingly affirm of this latitude that scarcely a case of intermittent fever need ever become chronic, and that even when so, proper management will hold the symptoms under control until the tendency is wholly overcome. The outline of the method is as follows: Inquire carefully into the history of the case, and whether acclimated or not, directing special attention to each of the abdominal organs, and, if much deranged, administer the best active corrective at once. Then anticipate the next paroxysm with twelve grains of quinine, divided into three doses, beginning its administration eighteen hours before the time of the expected chill. Repeat this amount of quinine every seventh day for four consecutive weeks, but at no other time, except when the patient's indiscretion brings on an irregular paroxysm. During the intervals administer daily gentle remedies appropriate to correct the functions that show the most derangement. These remedies should be such as will keep the organs mainly at fault up as near as possible to the standard of healthy action, and no more, never allowing the secretions or excretions of any organ to sink far below the healthy standard, nor causing them to rise much above it. The diet should be strictly hygienic, and so also of the exercise, not permitting the vital energy to be spent in toil that should be devoted to recuperation. To guard against external variations of temperature, especially in the unacclimated, flannel should be worn next the skin. The grand condition of success lies in the method and means for keeping all the abdominal organs during every day, and for several weeks, up to the standard of healthy action, and thus triumphantly raise the health above the ague point. Quinine is invaluable for the arrest of periodicity, but nothing more. By these means my success in treatment has been immediate and invariable, even in those cases in whom improper management had led to serious derangement of the liver, with enormously

* Abstract of Paper read before the Section on State Medicine and Public Hygiene, American Medical Association, Buffalo, June 6th, 1878.

enlarged spleen. An attempt to trace the course of thought that led these to therapeutical modifications leads back to the careful study of etiology and hygiene, and it is to these that I must attribute the many changes that I have been induced to make in the management of nearly all chronic diseases—changes that I have abundant evidence to consider, constitute a most important advance over old-time methods.

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Legislation Against Tramps.—We cannot do what the French Government once did under similar circumstances—banish 50,000 of them to colonial servitude; and it is a great pity that we cannot. If we could gather the whole disgusting multitude, wash them, put new clothes upon them, and under military surveillance and direction set them to quarrying stone, or raising corn and cotton for ten years, we might save some of them to decency and respectability, and relieve the honest people of the country of their presence and their support. If we cannot do this, however, there are things that we can do. Every State in the Union can gather these men, wherever found, into work-houses where they can be restrained from scaring and preying upon the community, and made to earn the bread they eat and the clothes they wear. It is necessary, of course, to throw away all sentimentality in connection with them. The tramp is a man who can be approached by no motive but pain—the pain of a thrashing or the pain of hunger. He hates work; he has no self-respect and no shame; and, by counting himself permanently out of the productive and self-supporting forces of society, he counts himself out of his rights. He has no rights but those which society may see fit of its grace to bestow upon him. He has no more rights than the sow that wallows in the gutter, or the lost dogs that hover around the city squares. He is no more to be consulted, in his wishes or his will, in the settlement of the question as to what is to be done with him than if he were a bullock in a corral.

Legislation concerning this evil seems to have been initiated in various States, but at this writing we cannot learn that anything effective has been done. It would be well if the States could work in concert in this matter, but one great State like New York, or Pennsylvania, or Ohio, has only to inaugurate a stringent measure to drive all the other States into measures that shall be its equivalent. The tramp whose freedom is imperilled in New York will fly to New Jersey or New England, and New Jersey and New England will be obliged to protect themselves. So one powerful State can compel unanimity of action throughout the country. The legislature of New York had a bill up a year ago which came to nothing. We hope the present session will see something done, but legislators have so many things to do besides looking after the public safety and the public morality, that we are quite prepared to hear that this matter will be overlooked. But something must be done, somewhere, very soon, if we propose to have anything like safety and comfort in our homes, or to relieve ourselves of a great burden of voluntary, vicious, and even malicious pauperism.—*Dr. Holland, in Scribner.*

MASSACHUSETTS STATE BOARD OF HEALTH.

Ninth Annual Report.

This Report is very similar in its arrangement, and in the matter it presents, to those previously published by the Board. This sameness is perhaps unavoidable, for many of its committees are constantly engaged from year to year in the same kind of routine work, and their reports must contain a repetition, from year to year, very little varied either in matter or in manner. Still it is a good report, and contains much valuable information. The energy, industry, and perseverance displayed are worthy of the cause in which the members are engaged, and place the Massachusetts Board at the head of all similar organizations in the United States. A proof of this statement may be found in the work done at Brighton. The abattoir there established is the best on this continent, is well managed, and has facilities for slaughtering seven-eighths of the cattle needed in the metropolitan district and for disposing of the various kinds of offal, etc., connected with the business. The Board have been so well pleased with the success of this abattoir, in all its details, that they have had plans of it prepared which, with a pamphlet giving a description of its workings and its management, have been sent to the Paris Exposition.

The slaughtering is done on a raised floor. Several trap-doors allow the heads and feet, hide, tallow, and offal to drop into separate iron wagons below. These, when filled, are wheeled into the rendering-house. The hides are salted in the basement, and the blood, fat, and other parts are raised, by means of elevators, to the rendering-tanks and driers. In most of the buildings the cattle are hoisted, for dressing, by means of steam power. An important feature of this establishment is the refrigerators, capable of hanging from sixty to two hundred cattle each. The meat is allowed to remain from one to two weeks before being brought to market, and thus its quality is improved.

The rendering-tanks are suspended from the floor of the fourth story, and are easily filled from this point. When the contents of the tanks are drawn off, the residuum is put into the driers and made into fertilizers. An important feature, and one that New York, Brooklyn, and other cities should carefully consider, is that the steam and offensive gases are received into a large iron vessel, through which cold water is continually passing. In this the steam is condensed, and the gases pass through an iron pipe under the furnaces, and are consumed so completely that there are no offensive odors at any time, although such a large mass of animal matter is constantly treated day and night.

During the four and a half years that this abattoir has been in operation there have been slaughtered, without offence or annoyance

to the community around it, 282,857 cattle and 1,321,573 sheep, an average of nearly 63,000 cattle and 294,000 sheep a year. The fertilizer made from the blood and offal has varied in quantity from 1,200 to 1,500 tons a year. The expense incurred for the purchase of land, the erection of buildings, and for providing the necessary machinery, has been about $630,000. This part of the Report will repay careful study by those who are interested in this inquiry.

"*Sanitation of Public Schools in Massachusetts*" is the title of a report by Dr. D. F. Lincoln. The site, construction, sewerage, drainage, and ventilation of school-houses in the State are carefully considered. As a means of obtaining the most reliable information in regard to the sanitary condition of the schools throughout the State, correspondence was held with many principals and teachers, as well as with the medical inspectors whose duty it was to examine the condition of such schools. Among the replies were the following: "The privies are near to the building, and of the *worst possible* construction and in the worst possible condition. No kind of regard has been paid to cleanliness or decency in any of them."

Again: "Privies 'not properly emptied and disinfected. *Decidedly* offensive odors.'" And the *Medical Reporter* says "that the air of the second-story rooms is contaminated by the privies; 'a state of things infernal in its origin and its character.'"

This statement suggests the crusade waged by the editor of THE SANITARIAN against the Turks and Saracens of the Brooklyn Board of Education, in consequence of the filthy and indecent condition of the privy accommodations attached to many of the public schools of that city. Although most of the members of the Board could see in him a Richard in the bush, they never relaxed their hold on the throats of the children entrusted to their care, and they, in most cases, still persist in supplying them with an unlimited amount of mephitic gases, along with the intellectual food which they provide. The misfortune is that the scholars may neglect the more useful food, though they cannot, from a law of their existence, refuse the poisonous gases.

Scarlet fever, it is said, destroys 23,829 lives in Massachusetts alone in twenty years, and this special Report is commended by the Board to the attentive perusal of the reader.

The Report gives a very full history of the disease—draws largely from the tables of Farr and Simon to show its comparative frequency and fatality. It then proposes to "consider whether some plan of action, agreed upon by physicians esteemed for their good judgment, and enforced by law, may not restrict within much narrower limits the spread of this infection." This is certainly a most desirable end to be gained, and the investigations necessary to its accomplishment have been made with the greatest care. Much was expected from this inquiry, correspondence was invited from all parts of the State, and a great deal of interesting and valuable information has been obtained, and yet there is not one definite conclusion presented as the result of it. It is candidly admitted that "the contagious matter of scarlet fever has not yet been isolated from the tissues and fluids of the body in which it exists. Neither its microscopical nor chemical characteristics have been determined."

The opinion of Dr. Sanderson is quoted as embodying, no doubt, the opinions of the author of the Report "that every kind of contagium consists of particles. . . . On grounds which have been stated, we regard it as probable that contagium particles are spheroidal, transparent, of gelatinous consistency, of density nearly equal to that of the animal liquids in which they float, and that they are mainly, but perhaps not exclusively, 'composed of albuminous matter.'" The reader must draw his own inference from statements that are regarded by their author as merely probable.

The disease is regarded as so highly contagious that there is hardly a relation that persons can hold towards one another that may not become the means of communicating it. Even distance is no protection, for it can be sent hundreds of miles in a letter; and the germs are capable of being preserved for an indefinite length of time.

On the other hand, M. E. Besnier, who has compiled the monthly reports for the "*Commission des maladies régnantes*" for many years past, in his report for the first quarter of the present year, says that during 1877 there were 1,576 deaths from scarlatina in London; while in Paris, during the same time, there were only 103 deaths, notwithstanding the rapid and frequent intercommunication, both of persons and commodities, between the two cities. Besides, while in London isolation is as complete as possible, in Paris it is scarcely attempted.

He says further: "It seems, then, that isolation may be neglected, at least for the present; but it cannot be neglected in cases of measles, in which it is as imperatively necessary as in small-pox or in diphtheria."

Amid so much uncertainty, how is it possible to determine the best means of disinfecting articles exposed to the contagium? Heat seems to be the great analytical agent, resolving compounds into their simples. The experiments of Dr. Henry with dry heat, at 212° Fahrenheit, and those of Dr. Bell, with steam, in disinfecting vessels, prove its great value, and show that, if it be not the only agent, it is certainly a very powerful one. There is no agent in nature more available than fresh air. It is within the reach of all, is present everywhere, except where we voluntarily or negligently render it impure. Under the direction of an enlightened physician or of an intelligent nurse the sick-room can be kept constantly disinfected, and the clothes, bedding, and other articles can be thoroughly disinfected by this means as soon as it will be safe to allow the patient to leave the sick-room. There is another advantage in this method which has not been sufficiently considered: by giving the poisonous element the proper number of dilutions you not only destroy its virulence, but on the principle, *similia similibus curantur*, you send it forth as an angel of mercy, with healing on its wings, as a most powerful prophylactic agent, to shield the whole neighborhood from harm.

There is just as much uncertainty regarding the real value of most of the disinfectants employed on such occasions as there is about the nature of the disease. Is it advisable, then, to appeal to the law to place restrictions on things that may be harmless, or to

enforce the observance of rules that are at best of doubtful utility; to indict the post-office, or to apply for a temporary injunction against the passage of the mails? The post-master in Texas who burned the mail-bags to prevent the spread of yellow fever will next, probably, apply to the Supreme Court for an injunction against the passage of the wind. There is a great deal of nonsense current under the garb of science. To expose it is as useful as to make new discoveries. It is well to keep in view the maxim: "Amicus Plato, sed magis amica veritas."

T. P. C.

Pure Milk by the "French Method."—In the "Home and Society" department of *Scribner* for July, Joel Benton describes a new experiment of a dairyman as follows:

These glass bottles, which are sent from "Sweet-clover Farm," in Sharon, Conn., and from nowhere else in the world, are made of beautiful clear glass, and, though of daintier proportions, resemble somewhat in shape the larger champagne bottles. They are supplied with a wired rubber cork, similar to that which is used for sarsaparilla and beer bottles, and on the side of the flange of the wire, which is to be raised before the cork can be opened, a paper label is pasted overlapping the wire on the glass neck, whereon is printed the day and date on which the bottle was filled. On the base of the bottle is a general label giving the advertisement of the farm on which the method originated, and a little piece of information of which we shall presently speak. When twenty of these bottles are filled they are put into a box just large enough to hold them, separated from each other by a rack partition.

It is easy to see that milk put up in this way says to the purchaser at once, and unmistakably, "I am 'the genuine article.'" For it would be utterly impracticable to try to tamper with it. The label, which cannot be broken without detection, gives to the buyer the correct history of the contents of every bottle; and when he draws the cork he knows that the grass his milk was secreted from was cropped the day before on the slopes of lovely pastures in Litchfield County, Conn. There is no fear of chalk, of chemicals, or of water. It is the same fluid you find in the pail as it comes from the country barn.

A sentence printed on the bottles tells us that the bottling of "Milk from one Cow" is a specialty; and to young children and invalids this news becomes a pleasant proclamation. For ordinary use the combination of the milk of twenty to a hundred cows suffices, if the dairy be well kept; but under special circumstances it is desirable, and in the case of delicate infants may save life, to have the milk which is used drawn regularly from one cow. When the bottles discriminate in this way an extra label is used to designate "Cow 25," or "Cow 34," and so on.

SUICIDE NOT EVIDENCE OF INSANITY.

By the Hon. O. H. Palmer, of New York.

Proceedings of the New York Medico-Legal Society, March 6th, 1878. The Hon. George H. Yeaman, President, in the Chair.

I do not know how it may be among scientific and professional men, but I think I am justified in saying that in the average mind there is a strong conviction that suicide is invariably the result of an insane impulse, in other words, that the act itself is conclusive evidence of insanity. I venture to say that in half the cases, if you put the question to an unprofessional man and ask an opinion, this will be the reply. The common belief is that no man will take his own life unless demented or insane. It is because we cannot readily comprehend that one in his right mind would throw away life, which we regard as a precious blessing, and take the chances of a future existence wherein, according to our Christian doctrine, the very act of *felo de se*, by a responsible being, is accounted a heinous crime deserving infinite punishment. The object of the present paper is to show the unsoundness of this too generally received opinion, and to prove, so far as I may be able, from facts and authority, that it is not well founded. You will not expect of me a scientific treatise on the subject of insanity, nor that I shall undertake to point out the shadowy line that divides the sane from the insane. I shall assume that there is a sane condition as well as an insane condition of the mind. I shall not take it for granted, as has been intimated by certain sceptics, that all mankind are lunatics.

The manifestation of states of mind is not uniform, but it is as varied and dissimilar as the expression of the human face or conformation of the human brain. There is no mathematical standard for the mind to which we can apply the square and compass, and determine and measure it. You who believe that the welfare and prosperity of the country depend upon the establishment of a sound financial system, and that the only true standard of value is the gold dollar, will hardly be justified in pronouncing insane those who insist upon the dollar of our fathers and the modern greenback as a cure for all our financial evils. From their standpoint they would have the right to apply the epithet to you. They may seem insane to you, and, *vice versa*, you may seem insane to them. The man of defective vision, who insists that blue is black, may be just as sane as the man of perfect vision, who can give colors their true character. The diversity of manifestation is immense, unmeasurable, and unascertainable. But this does not prove insanity or derangement of the normal condition of the intellect. Sanity is the normal condition of the mind in all its diversities and variety of character. This is law as well as logic.

This principle is now too well established in this country to be doubted or questioned, and yet outside of the literature of the courts it has but few believers. If any one doubts the fact let him attend the impanelling of the next jury in a case where the question is to be tried, when it is important to exclude from the jury-box such jurors as believe that suicide is of itself evidence of insanity, and he will doubt no longer. It is well known that life insurance companies decline to insure against suicide, and provide in their contract that if the insured feloniously destroy his own life they will not be liable. It is a risk they will not assume. The question is therefore frequently presented in the courts, and the provision is invariably sought to be avoided by alleging insanity. Hence the great importance of a correct understanding of the question involved in this discussion. Unless the popular belief can be corrected, the protection sought by the contract is of no avail, and the provision might as well be abandoned. It is believed that the stability of any system of insurance depends upon the right of the underwriter to determine what risks he will insure against, as well as upon an intelligent administration and application of the laws governing and protecting it. Disbelief in the doctrine that sanity is the normal condition of the mind, and belief in the doctrine that self-destruction arises from insanity, are heresies in the public mind which all reflecting men will say should be corrected. The true doctrine in respect to both of these heresies is abundantly established by the decisions of our highest courts, State and national. See Coffee *vs.* the Home Life Insurance Co., 35 N. Y. R., 314; Weed *vs.* the Mutual Benefit Life Insurance Co.; Van Zandt *vs.* the Mutual Benefit Life Insurance Co., 55 N. Y. R., 169; McClure *vs.* the Mutual Life Insurance Co., 55 N. Y. R., 651; Terry *vs.* the Mutual Life Insurance Co., 15 Wallace, 580; Charter Oak Life Insurance Co. *vs.* Rodd, in the U. S. Supreme Court.

These cases establish the doctrine that there is no presumption of law, *prima facie* or otherwise, that self-destruction arises from insanity.

If all mankind had implicit confidence in the decisions of our courts, I might safely rest the case upon these decisions; but unfortunately this is not so, and I deem it justifiable, therefore, to fortify my position by proving the soundness of the rule independent of judicial authority.

The law also regards suicide, *felo de se*, as a crime, putting it in the same category with murder. It has been so held for many centuries, not only by the State, but by the Church. In the Greek Church, and in the Roman Church, as well as in the Protestant Episcopal Church, it is severely condemned, and the burial service provides that the prescribed office for the burial of the dead is not to be used for any who have laid violent hands upon themselves. In England this crime was punished not only with forfeiture of estate, but the body of the *felo de se*, or self-murderer, was required to be buried in the open highway or cross-roads, and a stake thrust through it to mark the public detestation. This law, I am happy to say, is not now in force, having been repealed during the reign of George IV.; but even now I believe the body of the suicide is re-

quired to be buried at night without the performance of religious rites.

By the common law, also, if any one encourage or assist another in the commission of suicide, he is guilty of murder as a principal, and, by the ancient common law, a will of personal property was made void by the testator's subsequent act of self-destruction. Now these laws of the State and of the Church must be founded upon the idea of suicide without insanity; otherwise they would be monstrous.

If suicide were invariably the result of insanity, according to what may be termed the present popular belief, the law makers and religious teachers for many centuries have been guilty of the most enormous crimes.

By reference to the text-books upon this question, we find abundant authority to sustain our position.

In Wharton and Stillé's Medical Jurisprudence it is held that the propensity to self-destruction may coexist with sanity; that, whatever certain scientific authorities may assert, we are not warranted in coming to the conclusion that suicide is always the symptom or result of insanity; that there is no insanity present where the feeling of disgust with life is in exact relation with the circumstances; when evident moral causes exist which sufficiently account for the act; that when a man of delicate feeling puts an end to his existence, that he may not survive the loss of his honor or of some highly valued possession which forms an intimate part of his intellectual being, and when man prefers death to a miserable contemptible life full of mental and physical ills, although morality may indeed call him to account for the deed, yet there exists no ground for us to consider him insane; that the abhorrence of life and the idea of self-annihilation correspond to the intensity of the painful impressions which bear upon the individual, and it is after deliberate reflection that the act is resolved upon and perpetrated.

The court say in the case of Brooks *vs.* Barrett, 7 Pickering, decided in 1828, that the law does not consider the act of suicide as conclusive evidence of insanity; on the contrary, it is held as a crime, unless insanity be proven; that the presumption of law is, that all men are of sane mind, and those who would defeat this presumption by a suggestion of insanity must prove the exception to the general rule.

This doctrine has been handed down through the courts for many generations, and one would suppose it was now too well established to be questioned; but strange as it may appear, not long since a judge of one of our New York courts deliberately held, in an action upon a life insurance policy, that suicide *per se* was evidence of insanity, and so ruled in the case before him, and that the burden of proof that the *felo de se* was not insane was upon the defendant. That judge would, of course, have ruled, if the question had arisen in respect to the ancient Stoic or Epicurean philosophers who destroyed themselves, claiming the act to be one of heroism, that they were all insane. Among the ancients suicide was neither considered criminal nor dishonorable. Demosthenes, Thucydides, Mark Antony, and Cleopatra believed in it. Cato, rather than live under the

despotism of Cæsar, stabbed himself, and when the wound had been stanched, tore off the bandages and accomplished his purpose. Even the Scriptures and the Apocrypha furnish notable examples, as Eleazar, who, thinking he might deliver his people and secure glory and a perpetual name by killing King Antiochus, permitted himself to be crushed by the elephant that wore the royal harness.

Saul, because hard pressed in battle, rather than fall into the hands of the Philistines, took his sword and fell upon it, and so died.

Samson was betrayed into the hands of the Philistines by the woman in the valley of Sorek—as many others have been through the pursuit of illicit pleasure. The love of silver made her treacherous and dishonest; not that she sought to cheat her creditors by clipping the dollar, but was content to secure the treasure by clipping the locks of her deluded lover. As the green withes and new ropes failed to subject him to her power, so that she could deliver him to his enemies, she induced him to sleep upon her knees, and her victory was complete. Poor fellow, fool as he was, henceforth his life became a sore burden and made him the fit subject for suicide. His eyes were put out; he was bound in fetters of brass, cast into prison, and forced to work upon the treadmill. To add to his humiliation and sorrow, his enemies—forgetting that his hair had begun to grow—unbound him, that he might make sport for them while they were revelling over his degradation. In his agony of revenge, he prayed to God for a momentary return of his strength, and then, saying, "Let me die with the Philistines," seized the main pillars of the house, one with the right hand and one with the left, and bowed himself in his might, and the house fell upon him and his enemies, and he died with them.

Ahithophel, when his counsel was disregarded by his king and that of a rival adopted, arose and saddled his ass and got him home to his house and to his city, and put his household in order, and hanged himself, and died, and was buried in the sepulchre of his fathers.

Judas Iscariot, another devotee at the silver shrine, and whose name, I presume, is familiar to most of you, through remorse—not insanity—went and hanged himself. No investigation in this case —not even a coroner's verdict of temporary aberration of mind!

In speaking of the ancients, I ought perhaps to make some exceptions. Pythagoras, for instance, was evidently an exception to his time; for he not only opposed suicide strongly in theory, but called the act base and cowardly. Zeno and Epicurus, however, more fairly represented the condition of the heathen world. They were the founders respectively of the Stoic and Epicurean schools. They arrived at about the same results in their systems of philosophy, though they proposed to reach their objects by different roads.

Epicurus maintained that peace of mind was *summum bonum*, and that this was to be secured by cultivating and gratifying the mind's highest development. Zeno strove for what he called "unanimity of life," meaning by that a life inwardly harmonious and undisturbed, to be gained by crushing out the feelings and passions. In the opinion of both of these eminent men suicide was preferable to great pain or disgrace. This view accorded well with their theo-

ries, but it may be doubted whether they did not rather embody in them the principles professed by almost all the cultivated men of the age than deduce these results logically from the premises given. At all events, it is certain that men eminent in every calling, whether philosophers or not, killed themselves rather than be dishonored.

The generals Hannibal and Mithridates poisoned themselves rather than be taken prisoners. Even Cicero, coward though he was, doubted whether suicide would not be better than exile, and the touching story of Lucretia is never forgotten.

It must, however, be acknowledged that the professed philosophers were consistent in their practice.

Zeno, while going to lecture, fell down and put his finger out of joint. He returned home forthwith and hung himself. His successor as head of the school was Cleanthes. Cleanthes fell sick, and was advised by his physician to abstain from food. He did so, and his recovery was complete; but he thought that he had already gone so far on the road to starvation that it was not worth while to turn back and begin eating again, and so he died.

Perhaps the most striking case of determination among the philosophers who killed themselves was that of Seneca, himself a eulogist of suicide. The old man, evidently trying feebly to imitate Socrates, called his friends around him and had his veins opened. His blood, however, was scanty in quantity and slow of motion, and in order to hasten his death he was put into a warm bath. Still the slowness of his circulation resisted this stimulant, and he called for a cup of poison and drank it. But the spark of life seemed to be as tenacious as it was feeble, and he was only killed at last by being suffocated in a stove.

Pliny, reaffirming the doctrine of Xenophon, says in his work on natural history: "Deus non sibi potest mortem consciscere si velit, quod homini dedit optimum in tantis vitæ pœnis." "God cannot end his own life though He wish, but has given to mortals this best of boons amid the burdens and trials of life."

Valerius Maximus, who wrote in the first century, states that a poisonous liquor was kept publicly at Marseilles, and that it was given to such as exhibited themselves to the Senate and procured its approval of the reasons which prompted them to get rid of life; that the Senate examined their reasons with care, and after deliberating whether the applicants were justified in wishing to leave the world, gave or refused its sanction accordingly. If other poisonous liquors, the use of which probably more than any other single cause leads to suicide, could be prescribed only under similar sanctions, we should have the best excise law the world has ever seen.

Ælian, writing in the third century, affirms that the inhabitants of the Island of Ceos, in Greece, when they found themselves incapable, by reason of decrepit age, to serve the public, were accustomed to meet at an entertainment and drink hemlock juice, the State permitting those who were weary of life to thus poison themselves.

The ancients, at all events, did not agree with the New York judge in considering the suicide necessarily insane.

It is true the subject of suicide has as yet but a scanty literature,

especially in this country, and the little that does exist is not very satisfactory. One reason for this is that any complete study of the subject ought to be based upon a wide induction, and this can only be reached by careful statistics, almost wholly unattainable anywhere until within a few years. Many physicians have touched upon the subject, as, for instance, Dr. Maudsley, in his "Responsibility in Mental Disease"; but physicians generally begin to consider the subject on its diseased side, and are apt to incline to the belief (which I hope to convince you is wrong) that suicide is positive proof of insanity.

Of the English works on suicide by writers not medical, the most ambitious is the "Anatomy of Suicide," by Forbes Winslow, published in 1840; then going back, we find a worthless book by Solomon Pigott, 1824, written from the Sunday-school point of view; and last, and most worthy of notice, a two-volume octavo work by Charles Moore, printed in 1790. Moore, though he was a vicar at Oxford and dedicated his book to the Archbishop of Canterbury, had a mind impartial as well as highly cultivated, and had evidently studied his subject deeply.

I quote a few words from his book, which show that the insanity theory of suicide is not the pure growth of modern science, but was held by some people as far back as 1790. "But some," says Moore, "who are ever desirous of leaning toward the side of humanity, are inclined to judge that the very act of suicide, being so horrid and unnatural, implies a subversion of the brain or a species of madness. This, however, is deciding too favorably of the matter."

The severity of the penalties inflicted upon the bodies, estates, and descendants of the *felo de se*, to which I have adverted, has undoubtedly had a powerful influence in propagating the belief that suicide was the result of insanity. It was to avoid those horrid penalties that coroners' juries were originally accustomed to bring in verdicts that the suicide was insane. Bentham says: "English juries did not hesitate to violate their oaths by declaring the suicide *non compos*." At the time, mercy seemed to make this finding a necessity. It was the outcome of humanity in defiance of a barbarous and revolting law. Although the necessity has passed away, the result of this forced education is yet manifest, and the coroner's jury of to-day, especially if it can be impressed with the idea that benefit is to accrue to the surviving friends, is almost invariably inclined to return the verdict stereotyped three hundred years ago—"Suicide while laboring under temporary aberration of mind."

Lecky, in his "History of European Morals," says: "The effect of the pagan examples may frequently be detected in the last words or writings of the suicides. Philip Strozzi, when accused of the assassination of Alexander I., of Tuscany, killed himself through fear that torture might extort from him revelations injurious to his friends, and he left behind him a paper, in which, among other things, he commended his soul to God, with the prayer that, if no higher boon could be granted, he might at least be permitted to have his place with Cato, of Utica, and the other great suicides of antiquity."

The ancient heathen philosophers to whom I have referred are not the only advocates of the crime of suicide. It has had its defenders, and powerful ones too, in more modern times—Rousseau, Madame de Staël, Gibbon, Hume, Dr. Donne, Montaigne, Montesquieu, and others. We do not know nor can we tell the extent of the influence of the teaching of these apologists of suicide upon the thousands that annually seek, as matter of choice, this relief from the ills of life while in the full possession of all their mental powers. It would be a happy relief, were it true, to think that none but the insane shuffled off the mortal coil in that way.

Even under British rule in India to-day suicide is very common, and more or less tolerated of necessity by the authorities. Among the many castes in that country is one held in high esteem by reason of the great importance of the service its members perform as carrier-messengers and mail-carriers. Strange as it may seem, suicide has been the protection of this caste against brigands and highwaymen from time immemorial. A peculiar and terrific custom of this caste is maintained as a necessary safeguard to its calling. A carrier who has been robbed is deemed to have been despoiled of what is a thousand times dearer to him than life, his honor; and in the presence of the robber, after vainly giving him full warning and an opportunity to restore the property stolen from him, he kills himself; thereupon the whole caste of the carrier rises as one man and swears a remorseless vendetta against the thief, his family, kinsmen, friends, and village, until the last soul of them is exterminated. There is no other atonement. The carrier entering the service of the public bound himself, by the most solemn and fearful oaths, under the sanction of his religion, to protect his caste and to punish any attempt to dishonor one of its members; the Brahmins consecrated this service by pronouncing the most appalling anathemas against the transgressor, and so the custody and transportation of property by one of their caste passed into a law. At this day a package, however valuable, in the hands of one of these men is safer than though guarded by an army; much safer than public moneys under the control of politicians or trust funds in the care of some savings banks. It might be a blessing if we had a similar caste in this country to declare a relentless vendetta against thieves and robbers.

There is another Brahmin custom executed by this carrier caste which may be termed a short and effectual way for the collection of debts. In many of the provinces of Malabar the carrier will become security for the payment of debts by pledging his life to the creditor, for proper consideration, that the debtor shall fulfil his obligations. If on the day of payment the creditor is not satisfied, the carrier goes and sits quietly on the debtor's veranda, and calls upon him to pay on the spot. If he refuse the carrier makes a few incisions in his breast with his dagger, and in a loud voice gives notice that if by sundown the debt is not paid, he will plunge the dagger into his own heart, leaving vengeance to his caste. This process never fails; the debtor cannot escape. Neither the ingenuity of lawyers, nor the weakness of judges, nor the stupidity of jurors can save him. No bills of exceptions or dilatory motions can postpone the day of payment.

The hari-kari custom of the Japanese is familiar to all, but there is another custom peculiar to them which perhaps is not so generally known. The man who resents an insult by disembowelling himself goes out of the world in the happy belief that he can at once come back as an avenging spirit and work his enemy tenfold more harm in that way; that he can hover about his path, make his plans miscarry, bring sickness and all sorts of evil upon him, and control his destiny to an evil end.

It was my purpose in the outset to present the statistics of this increasing and appalling crime in our own country; but to my great disappointment and amazement I find it impossible. I have looked into the United States Census Reports. I could give you, from them, the number of the insane and the idiotic, the number of deaths by consumption and many other diseases; but not a word as to deaths by suicide. This subject, which I think is one of the greatest importance in vital statistics, seems to have been wholly ignored. There are no reliable data in this country that I can find to enable me to lay before you the facts which, if available in detail, would fully verify the position I have assumed.*

In many of the European countries there is less embarrassment. In Germany and France especially, great care is taken to ascertain and preserve the facts bearing upon the question. It is a shame that it has hitherto been so much neglected here. One of the most celebrated German writers on vital statistics, and who is of the highest authority on that subject the world over, Alexander Von Oettengen, has collected and collated the statistics of suicide in Germany and many other European countries, and has deduced therefrom some interesting general laws. He maintains that suicide is one of the strongest proofs of freedom of the individual will; that the possibility of taking one's own life, either from disgust or from higher motives, as in the manner of the Buddhists or Stoics, is evidence that a man is his own master; that the commission of crime, as well as suicide, in many cases shows strength of will; that, notwithstanding the love of life, the tendency to suicide remains, and the number of suicides increases; that the increase in European countries is from three to five per cent., while the increase of population is less than two per cent; that this tendency varies according to the season of the year; that it is more frequent in the hot summer months than in winter; that the heat seems to increase the tendency and debilitate the physical system or power of resistance; that every sinner carries the germ of suicide in him; that the bad deed itself is to be regarded as the ripe fruit which is shaken from the tree by the storms of social life; that while myriads have the germ or tendency to suicide in their hearts, it is only developed by

* In some of the principal cities creditable efforts have been made to preserve the statistics; and the census of the State of New York for the year 1875, I am happy to say, has made an attempt to tabulate the number of deaths by suicide in the respective counties of the State; but the basis is not yet broad enough to justify any general induction for the whole country. Nor is the enumeration sufficiently reliable to form the basis of any intelligent law on the subject.

circumstances; that society, generally, is involved in the responsibility of the increase of this tendency; that the rich, by helping the poor, succoring the distressed, inculcating sobriety and religion, might materially mitigate the growing evil; and that as each age has its tendency to crime, so also it has its tendency to suicide.

Buckle, in his "History of Civilization," says it is "an astonishing fact that all the evidence we possess respecting it points to one great conclusion, and can leave no doubt on our minds that suicide is merely the product of the general condition of society, and that the individual felon only carries into effect what is a necessary consequence of preceding circumstances." He maintains that there exists a regularity in the entire moral conduct of a given society—that the crimes of murder and suicide, which might well be supposed the most arbitrary and irregular of all the offences, are "committed with as much regularity and bear as uniform a relation to certain known circumstances as do the movement of the tides and the rotation of the seasons."

He illustrates this by contrasting the circumstances which surround the respective criminals.

Of the crime of murder: "When we consider that this, though generally the crowning act of a long career of vice, is often the immediate result of what seems a sudden impulse; and when premeditated, its committal, even with the least chance of impunity, requires a rare combination of favorable circumstances, for which the criminal will frequently wait; that he has thus to bide his time, and look for opportunities he cannot control; that when the time has come, his heart may fail him; that the question whether or not he shall commit the crime may depend on a balance of conflicting motives, such as fear of the law, a dread of the penalties held out by religion, the prickings of his own conscience, the apprehension of future remorse, the love of gain, jealousy, revenge, desperation—when we put all these things together, there arises such a complication of causes that we might reasonably despair of detecting any order or method in the result of those subtle and shifting agencies by which murder is either caused or prevented."

Of the crime of suicide: "Among public and registered crimes there is none which seems so completely dependent on the individual as suicide. Attempts to murder or to rob may be, and constantly are, successfully resisted; baffled sometimes by the party attacked, sometimes by the officers of justice. But an attempt to commit suicide is much less liable to interruption. The man who is determined to kill himself is not prevented at the last moment by the struggles of an enemy; and as he can easily guard against the interference of the civil power, his act becomes, as it were, isolated; it is cut off from foreign disturbances, and seems more clearly the product of his own volition than any other offence could possibly be. We may also add that, unlike crimes in general, it is rarely caused by the instigation of confederates; so that men, not being goaded into it by their companions, are uninfluenced by one great class of external associations, which might hamper what is termed freedom of will. It may, therefore, very naturally be thought impracticable to refer suicide to general principles, or to detect anything like

regularity in an offence which is so eccentric, so solitary, so impossible to control by legislation, and which the most vigilant police can do nothing to eliminate." Yet he finds the same general law that in a given state of society a certain number of persons will commit murder, and a certain number put an end to their own lives by suicide.

I have seen a statement which strikingly illustrates this fact, namely, that in the year 1793 suicide became an epidemic in the city of Versailles, in France, and raged to such an extent that in that single city there were 1,300 cases during that year. Also, that at one time it broke out in the army of the first Napoleon, and threatened to decimate his forces, and was only checked by the Emperor's strong personal appeal to the patriotism, pride, and courage of his soldiers. Von Oettengen shows also that the suicidal tendency varies with the days of the week and hours of the day; that on Saturday fewer men take their lives, that being the day when wages are paid and Sunday is before them; that on Monday and Tuesday the percentage is much greater; that the difference between men and women in this respect is very characteristic; that the woman oftener commits suicide on Sunday, when the vagabond man leaves her to her care and sorrow—very seldom on Saturday, cleaning day, or on Monday, when her week's work begins; that, on the contrary, when the man's work begins, the percentage among men increases; that race and social circumstances have an important bearing upon the question; while in one of the provinces of France the deaths by suicide are 298 in a million of inhabitants; in Corsica, where murder is the common pastime, they are but $13\frac{8}{10}$; in Scandinavia, 126; among the Germans, 112; among the Roman races, 80; among the Sclavs, 47; and in Prussia, 215.

Suicide occurs more frequently among prisoners and persons who lead bad lives; next among servants and soldiers; next among those who come in contact with the varnish and luxury of civilization, without being inwardly elevated or having developed self-reliance, for the reason that superficial culture leaves them less able to resist overwhelming calamities.

In respect to suicide, the ratio of women to men is as one to three; that in respect to crime as one to five; the tendency to suicide increases with age, the number being far less between sixteen and forty than between fifty and seventy.

It is stated on the authority of Dr. De Boismont that since the beginning of the present century not less than 100,000 Frenchmen have committed suicide. I am inclined to think that, large as the number is, it is understated. The statistics for the single year 1876 show the number for that year alone was 5,567, of whom 4,435 were men and 1,132 women; 29 were men under the age of sixteen, and 98 over eighty; 1,828 were peasants, 1,038 of the working classes, 228 domestics, 987 of the liberal professions.

Among the causes assigned are the following: Drunkenness, 1,443; afflicted with incurable diseases, 798; domestic broils, 633; dread of poverty, 320. Less than one-third of the whole number in this sad list charged to insanity.

It will be seen that all these facts when analyzed—and I might

add many more—prove inevitably the fallacy of the theory that suicide is the result of insanity. There has been a custom among the Japanese which the most inveterate believer in the doctrine that suicide is *per se* evidence of insanity would find it difficult to reconcile with his theory. If the Oriental desired to inflict sure and summary punishment upon his enemy, he would kill himself upon his enemy's front door-step, and such enemy was thereupon in duty bound to take his own life.

(*To be continued.*)

The Prime of Life.—Between the ages of forty-five and sixty a man who has properly regulated himself may be considered in the prime of life. His matured strength of constitution renders him almost impervious to an attack of disease, and experience has given soundness to his judgment. His mind is resolute, firm, and equal; all his functions are in the highest order; he assumes mastery over his business; builds up a competence on the foundation he has laid in early manhood, and passes through a period of life attended by many gratifications. Having gone over a year or two over sixty he arrives at a stand-still. But athwart this is the viaduct called the turn of life, which, if crossed in safety, leads to the valley of "old age," round which the river winds, and then beyond, without boat or causeway, to effect his passage. The bridge is, however, constructed of fragile material, and it depends how it is trodden whether it bend or break. Gout and apoplexy are also in the vicinity to waylay the traveller, and thrust him from the pass; but let him gird up his loins and provide himself with a fitter staff, and he may trudge on in safety and with perfect composure. To quit metaphor, "the turn of life" is a turn either into a prolonged walk or into the grave. The system and powers having reached the utmost expansion, now begin either to close like a flower at sunset or break down at once. One injudicious stimulant, a single fatal excitement, may force it beyond its strength, whilst a careful supply of props and the withdrawal of all that tends to force a plant will sustain it in beauty and vigor until night has entirely set in.

Nursing Sore Mouth is seen in patients who seem to be well in other respects; is generally an index of lowered vitality—sometimes an inflammation, the result of local nutritive disturbances of reflex origin; the irritation being mammary. In the ptyalism of pregnancy we see an instance of the same etiological kind. Stomatitis materna takes the form of acute or chronic aural catarrh, also aphthous and ulcerative stomatitis. It is sometimes very obstinate and intractable. Weaning the child always brings about a speedy cure. It is generally, however, amenable to treatment of a simple nature. Where, from lowered vitality, a tonic regimen—as quinine, porter, iron,and cod-liver oil—is required, there are two preparations of the latter in the market which I find almost equally serviceable—Scott's Emulsion and Phillips's. Many, however, can take Phillips's oil that cannot take Scott's. Phillips's oil is borne by the most delicate stomachs. I consider this preparation invaluable for nursing women whose nutrition is below par.—*The Medical Record, June 8th.*

Editor's Table.

Yellow Fever. "WASHINGTON, October 12th, 1878.

Abstract of Sanitary Reports received during the past week under the National Quarantine Act:

New Orleans, La.—There were 988 cases of yellow fever and 340 deaths during the week ended yesterday afternoon. For the last 24 hours, 164 cases and 49 deaths. The disease now prevails throughout the city. Total cases, 11,206; total deaths, 3,400.

Port Eads, La.—One death from yellow fever occurred in the past week.

Baton Rouge, La.—397 cases of yellow fever and 35 deaths for the week ended 9 A. M. yesterday. Total cases, 1,869; deaths, 113.

Morgan City, La.—During the week ended yesterday there were 128 cases of yellow fever and 23 deaths. Total cases, 428; deaths, 71.

Ocean Springs, Miss.—25 new cases of yellow fever and 6 deaths for the week ended at noon yesterday. Total cases, 103; deaths, 28.

Pass Christian, Miss.—For the past week there were 35 cases of yellow fever and three deaths. Total cases, 94; deaths, 9.

Bay St. Louis, Miss.—During the past two weeks ended yesterday evening there were 208 cases of yellow fever and 36 deaths. Total cases, 286; deaths, 56.

Biloxi, Miss.—From commencement of outbreak of yellow fever to the 11th inst. there have been 275 cases and 28 deaths.

Port Gibson, Miss.—The yellow fever has spread into the country; at least thirty plantations surrounding Port Gibson are now infected. The deaths to date are estimated at 190.

Friar's Point, Miss.—There have been 13 cases of yellow fever and 4 deaths to yesterday evening.

Crystal Springs, Miss.—Total cases of yellow fever to yesterday evening, 81; deaths, 36. The fever first appeared at Dry Grove neighborhood, twelve miles north-west of Crystal Springs.

Hernando, Miss.—The first case of yellow fever—a refugee from Memphis—occurred August 31st. 23 cases and 10 deaths during the past week. Total cases to yesterday evening, 83; deaths, 33.

Grenada, Miss.—Six cases of yellow fever and 2 deaths for the past week. Corrected total deaths to yesterday evening, 323.

Spring Hill, Grenada Co., Miss.—15 cases of yellow fever and 6 deaths to yesterday. First case October 1st.

Vicksburg, Miss.—For the past week there were 33 deaths from yellow fever. 96 deaths have occurred in Warren County, outside of Vicksburg. Total deaths in the city and county, 978.

Holly Springs, Miss.—Total cases of yellow fever to October 8th, 1,064; total deaths to that date, 241.

Jackson, Miss.—Between 30 and 40 cases of yellow fever reported to October 5th.

Memphis, Tenn.—There were 157 deaths from yellow fever for the week ended the evening of the 10th inst. Total deaths, 2,784.

Brownsville, Tenn.—139 cases of yellow fever and 35 deaths for the week ended yesterday afternoon. Total cases, 413; deaths, 121.

Paris, Tenn.—The first case of yellow fever among the inhabitants occurred September 6th. The first case of the fever among refugees, August 23d. Total cases to yesterday evening, 52; deaths, 22.

Cairo, Ill.—Total cases of yellow fever to yesterday evening, 31, besides 5 doubtful cases; total deaths, 25. Assistant Surgeon Waldo, of the Marine Hospital Service, taken sick on Thursday, probably with yellow fever.

St. Louis, Mo.—No cases of yellow fever in the city. 3 deaths at quarantine during the past week, two of which were refugees. The superintendent of the quarantine station is sick with yellow fever.

Louisville, Ky.—For the week ended yesterday evening there were 10 new cases of yellow fever and 8 deaths, of which numbers 9 cases and 7 deaths were among the inhabitants residing in the infected portion of the city referred to in previous reports. Total cases, 112; deaths, 49. Of these, 88 cases and 34 deaths are refugees.

Cincinnati, Ohio.—No new cases or deaths have occurred since last report up to the 9th inst.

Mobile, Ala.—There were 7 cases of yellow fever and 3 deaths since noon of October 4th to October 11th. Total cases, 37; deaths, 20.

Decatur, Ala.—The first case of yellow fever occurred September 7th. Total cases to yesterday evening, 82; total deaths, 15.

Key West, Fla.—Two cases of yellow fever occurred this week, the first since the 21st of September. Total cases, 37; deaths, 16.

Canton, Miss.—From October 4th to October 10th there were 90 new cases of yellow fever and 26 deaths. Total cases to that date, 810; deaths, 139.

Havana, Cuba.—26 deaths from yellow fever and 3 from small-pox, week ended October 5th.

No reports received from the following places where yellow fever exists: Greenville, Miss.; Mississippi City, Miss.; Water Valley, Miss.; Chattanooga, Tenn.; Grand Junction, Tenn.; Hickman, Ky.; South Pass, La.; Plaquemine, La., etc.

South America.—At *Rio de Janeiro* there were 3 deaths from yellow fever and twenty-four from small-pox during the week ended September 19th. Good health prevails in Barranquilla, New Grenada. Advices September 19th.

Europe.—In 132 cities and towns of the German Empire, having an aggregate population of 7,376,861, there were 3,787 deaths from all causes for the week ended September 23d, being an annual rate of mortality of 26.7 per 1,000 of the population. Among the deaths reported there were 104 from scarlet fever, 1 from typhus, 104 from diphtheria and croup, and none from small-pox.

At *Vienna, Austria*, during the week ended September 14th, were there 12 deaths from small-pox, 2 from typhus, 3 from scarlet fever, and 12 from diphtheria.

Africa.—A dispatch from the U. S. Consulate at Gibraltar, September 23d, states that private advices from Tangier announce 103 deaths from cholera at Casablanca, Morocco, on the 17th of September; Moors, Jews, and Christians being attacked by the disease. At Fez the cholera is reported as increasing. Cholera has broken out in several other places in the interior of Morocco. At Mogadore, Morocco, the deaths from hunger and typhus are reported to be from 60 to 70 per day. The hungry Moors attacked the Custom House and British and Spanish Consulates at that place, and were repulsed with loss.

Asia.—31 deaths from cholera in *Bombay*, week ended August 20th. No deaths from cholera in *Calcutta* for week ended August 10th.

JNO. M. WOODWORTH,
Surgeon-General U. S. Marine Hospital Service.

American Public Health Association.—We are gratified with the receipt of the following communication, and sincerely hope for it the attention which it deserves:

NEW YORK, October 8th, 1878.

To Members of the American Public Health Association and others interested in Public Hygiene:

The Executive Committee of this Association found it impracticable to hold the Annual Meeting at Warm Springs, Va., as was proposed at the Chicago meeting; but an urgent necessity has arisen for convening late in the autumn this year, at some place

most convenient to the South. The events of the terrible epidemic of yellow fever in the Mississippi Valley have aroused the whole country to such concern in regard to the causes, the sanitary control and the prevention of that destructive pestilence, and respecting the means for protecting the public health generally, that these sanitary questions have assumed a national importance; and in this view the Association is now called to act promptly in promoting the most effectual investigation of the causes of the great epidemic. To this end the officers of the Association have responded to all requests for counsel and coöperation in preparing for such an investigation, and the Executive Committee hereby appoints the Sixth Annual Meeting to be held in the city of Richmond, Va., the 19th to 22d of November next, to consider the reports and propositions offered by its members and others relating to the epidemic to the sanitary measures for preventing the recurrence of such calamities. The first days of the session will be devoted to the report and evidence submitted by the Yellow Fever Commission under the Surgeon-General of the United States Marine Hospital Service, as that important work has been undertaken with the advice and coöperation of members of this Association.

The results of the labors of that Commission and of the deliberations of this meeting will, it is believed, be of very great importance to the nation, while they will promote needed legislation and determine most essential reforms in public health government. Contributions of information and study relating to yellow fever and the epidemics of the present year are solicited from all quarters; but it is expedient to devote this meeting quite exclusively to the thorough discussion of the evidence concerning the preventable causes of the epidemic visitation which has brought mourning throughout the land and paralyzed the commerce of vast regions of our country.

The brief outline here annexed is submitted as a basis for the propositions to be discussed, and with the returns which will be in the hands of this Committee a month previous to the meeting a more complete schedule will be prepared and published.

Members of this Association residing in Virginia, the Governor of the State, and other citizens, have tendered ample facilities for the meeting, which will be held in the hall of the House of Delegates at Richmond.

Eminent public men from the South and from the chief cities of our country have promised attendance, and this Committee cordially invites medical and sanitary authorities, and other citizens who seek to promote the public health, to participate in the deliberations, to be wholly devoted to sanitary matters of State and national importance. Signed by the

EXECUTIVE COMMITTEE.

Order of Business.—Reception of Report of the Commission investigating the History of the Epidemic of Yellow Fever, submitted by Dr. J. M. WOODWORTH, Surgeon-General of United States Marine Hospital Service..

Reception of the other Reports and Records of this Epidemic—from all sources.

Reception of other Reports and Communications on the epidemics and sanitary experience of the present year.

Announcement of the contributions of information and the presentation of communications from members of the Association, State Boards of Health, Municipal Sanitary Officers, and others.

The READING and DISCUSSION of the Reports and Papers will follow in the above order. It is believed that the first two or three days of the meeting will be devoted to deliberations upon the Report and body of evidence which the Yellow Fever Commission under the Surgeon-General of the Marine Hospital Service will submit.

The Executive Committee has arranged to give up this meeting wholly to the duty of analyzing the evidence concerning the present epidemic and the means of prevention. It is arranged that the essential subdivisions of the whole subject shall be assigned to experts in each division for report by sections.

Thus the questions and evidence relating to the transportation of infection from place to place, and the propagation of it, will be referred to a suitable committee to analyze and report upon as early as practicable in the session. The localizing causes and sanitary topography will, in like manner, be considered and reported upon, and so on through the whole body of testimony and experience.

State and Municipal Boards of Health, and the public-spirited citizens who have become concerned in protective measures against yellow fever and other dangers to the public health, physicians, naturalists, civil engineers, and other scientific contributors to sanitary science and works for the public welfare, are cordially invited to attend and assist at this Conference.

Election of New Members.—There will be an election of members the *first* day of the session. A large number of names is now before the Executive Committee, and all who desire to coöperate in the Association are invited to send in their address to the President or Secretary as soon as convenient.

ABSTRACTS OF PAPERS AND BRIEFS FOR FACILITATING DISCUSSIONS.—Each author and speaker who proposes discussion is requested to have a condensed *abstract* of the Paper or of the chief points which he discusses, and which should be furnished to the press.

NOTE.—" . . . All members preparing scientific reports or papers to be laid before the Association at its annual meetings must give, in writing, the title of such reports or papers, the time to be occupied in reading them, and an abstract of their contents."—(Section VIII. Constitution of the Association.)

His Excellency the Governor of Virginia will welcome the Association at its opening session.

At a special conference of the Executive Committee of the American Public Health Association, with a few eminent physicians and public-spirited citizens interested in sanitary measures, at the Acad-

emy of Medicine, on Wednesday evening, October 16th, the following action was taken:

Resolved, That, in view of the necessity for the utmost thoroughness and practical efficiency of the investigation undertaken by the Yellow Fever Commission and the American Public Health Association, it is the opinion of those here in conference that the researches thus begun ought to be steadily pressed forward, and that the National Government should undertake to provide for completing this work, and also to do whatever shall be found necessary to protect the ports and pathways of commerce in the United States against yellow fever.

Resolved, That we respectfully recommend that the Chambers of Commerce and Boards of Trade, as well as the State and Municipal sanitary authorities in all regions of our country liable to be visited by yellow fever, should appoint suitably qualified members to attend the Sanitary Conference at Richmond, Va., on the 19th to 22d of November next, and, further, to have such persons in readiness to advise and coöperate in securing the adoption of the requisite sanitary measures.

Resolved, That we cordially approve and commend the work of the Commission under the direction of the Surgeon-General of the United States Marine Hospital Service, and hereby express our conviction that it should be amply maintained by voluntary contributions until Congress shall provide for completing the researches concerning this epidemic.

Resolved, That we should deem it expedient to have the educated classes—especially those who have been most responsibly engaged in the care and provision for the sufferers by the epidemic—very carefully interrogated by means to be devised and adopted by the Yellow Fever Commission and the Public Health Association, for the purpose of gleaning the practical kind of information that should be obtained when fresh and accurate.

Circular Letter to Physicians and Others in Reference to the Investigation of the Yellow Fever Epidemic of 1878:

Acting upon the advice of members of the American Public Health Association, the Surgeon-General of the Marine Hospital Service has organized a Commission to gather and record all important *facts* relating to the commencement and spread of the present epidemic of yellow fever, with the view of establishing truths upon which the theory and practice of prevention of future epidemics may rest.

The gentlemen composing the Commission—Prof. Bemiss, of New Orleans, Dr. Cochran, of Mobile, and Prof. Howard, of Baltimore—have already commenced their work in New Orleans, and will visit the principal places in which the yellow fever has prevailed.

The cordial coöperation of all who have facts to communicate bearing upon the subject under investigation is earnestly solicited for the Commission.

A preliminary report of the facts, gathered up to the 19th day of November next, will be presented to the American Public Health Association, which will convene on that day in the city of Rich-

mond to discuss the report, and to advise the best course to be pursued in concluding the labors of the Commission.

It is not intended to terminate the investigation on the 19th of November, but it is desirable that those interested in public hygiene in all parts of our country should meet in council prior to the assembling of Congress, as it is generally believed that legislative action will be promptly taken in reference to preventing future epidemics. The agitation of the public mind upon this important subject is proper and commendable, but herein lies the peril of hasty or not fully matured legislation, and it is hoped that by the action proposed Congress may have the benefit of the advice of the representative men of sanitary science.

The invitation of the Officers and Executive Committee of the American Public Health Association, extended for the Richmond meeting, is to "medical and sanitary authorities and other citizens who seek to promote the public health." This will afford an opportunity for all who desire to advise in reference to the work in hand.

If the voluntary contributions of money for the expenses of the Commission are sufficient, it is intended to add to the Commission a Sanitary Engineer, a Microscopist, and a Meteorologist.

The first step in the investigation is, as already stated, an examination into the causes of the commencement and spread of the epidemic, now being prosecuted by the Commission.

The second step is the study of the natural history of the disease itself, which will be undertaken if the contributions of money warrant.

It is believed that the study of the treatment of the disease should not be added to the labors of the Commission. The contributions of experience in this direction will doubtless be numerous, and may be properly left to the medical journals of the country and to individual reports.

Very respectfully,

JNO. M. WOODWORTH,

Surgeon-General U. S. Marine Hospital Service.

Washington City, October 10th, 1878.

Boston, 1877.*—Population, 360,000. *Births* recorded, 10,530—a decrease of 243 compared with the preceding year; 1,187 less than in 1874, and 75 less than in 1872. Ratio to population, 1 in 34.19; adding the still-births (469), ratio, 1 in 32.73. The excess of living births over the deaths for the year was 3,246; in the preceding year 2,570. There has been a considerable decrease in the number of still-births reported during the last three years, which the registrar remarks is doubtless owing to a failure to report them according to law. How large a number have been withheld may be judged from the fact that in 1872 the number recorded was 560; in 1873, 515; in 1874, 642; in 1875, 541; and in 1876, 491. A new law which went into effect May 1st, 1878, it is supposed will remedy the defect.

Marriages recorded, 2,873—a decrease from the previous year of

* Annual Report of the Births, Marriages, and Deaths for the year 1877. By N. A. Apollonio, City Registrar.

108. Yearly average for ten years ending with 1877, 3,835. Daily average: 1877, 7.87; 1876, 8.17; 1875, 9.36.

Deaths, 7,284—a decrease from the previous year of 919, and 1,674 below the number registered in 1875. Ratio per 1,000, 20.23, or 1 in 49.42 of the whole population. 3,653, or 50.15 per cent. of the whole number, were under 20 years of age; between one and five, 16 per cent.; under one year, 23.64 per cent.

Chief causes of death: Consumption, 1,273, or 17.48 per cent. of all who died; 32.83 per cent. of the deaths from this cause were between 20 and 30 years of age. Pneumonia, 484—6.64 per cent. Zymotic diseases killed 26.99 per cent. Of these diseases the chief were: Diarrhœal diseases, 930; croup and diphtheria, 482; scarlatina, 113; typhoid fever, 157; whooping-cough, 89.

Colored population: In 1876—for the first time for several years—the number of births exceeded the number of deaths, but by only 3; in 1877 the number of decedents exceeded the number of births by 12. Total number of colored decedents for the year, 174: ratio to the colored population of 1 in 28.73, or 34.82 per 1,000. 35.63 per cent. of the whole number died of tubercular diseases.

Foreign Mortality.—Ratio per 1,000 inhabitants annually. September 15–21: London, 18.2; Glasgow, 19.2; Liverpool, 27.4; Birmingham, 28.1; Manchester, 20.1; Dublin, 22.4; Leeds, 23.8; Sheffield, 24.9; Edinburgh, 15.2; Bristol, 19.5; Belfast, 24.0; Bradford, 22.6; Salford, 20.2; Newcastle, 26.0; Hull, 25.2. September 8–14: Amsterdam, 21.3; Rotterdam, 23.7; The Hague, 23. September 14–20: Paris, 20.2. September 6–12: Lyons, 23.6. Month of August: Marseilles, 32.9. July 16–31: Lille, 24.4. September 5–11: Havre, 26.5. September 1–7: Berlin, 31.2. September 8–14: Hamburg, 28.2; Breslau, 35.4; Munich, 27.6; Dresden, 26.4. September 15–21: Cologne, 19.1. September 8–14: Koenigsberg, 30.4. September 15–21: Frankfort-on-the-Main, 19.1. September 8–14: Hanover, 20.8; Bremen, 22.2. September 15–21: Dantzig, 37.1. September 8–14: Stuttgart, 20.09; Strasbourg, 24.2; Nuremberg, 28.8; Barmen, 19.1; Magdeburg, 28.1; Altona, 21.5; Elberfeld, 22.5; Dusseldorf, 23.5; Stettin, 20.9; Chemnitz, 41.2; Aix-la-Chapelle, 33.9; Brussels, 20.6; Anvers, 20.3; Gand, 19.5; Liege, 24.8. September 18–24: Vienna, 20.7; Buda-Pesth, 41.5; Prague, 17.6; Trieste, 34.6; Lemberg, 24.3. September 11–17: Copenhagen, 21.1. September 8–14: Stockholm, 21.7.; Christiania, 17.9. September 1–7: St. Petersburg, 36.7. September 8–14: Warsaw, 29.8; Odessa, 50.0. August 4–10: Rome, 17.6. Month of June: Milan, 28.3. September 1–7: Turin, 17.6. Month of June: Genoa, 22.1. September 1–7: Venice, 17.7. Month of June: Bologna, 32.6. September 1–7: Barcelona, 29.0. August 25–31: Lisbon, 35.5. September 8–14: Bucharest, 27.2. August 25–31: Alexandria, 66.2. July 1–15: Rio de Janeiro, 60.2. August 4–10: Calcutta, 26.7. August 14–20: Bombay, 33.9. August 2 to July 27: Madras, 35.8.

Death-rates per 1,000 inhabitants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Pox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Typ. Fevs	Malarial Fevers.	Diarrhœal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500—4 weeks ending Sept. 21..	2040	24.52	1010	321		48	36	8	20	49	39	28	394	15	160
Philadelphia, 850,900—4 weeks ending Sept. 28..	1127	16.84	466	182			32		18	15	41	1	71		78
Brooklyn, 528,000—4 weeks ending Sept. 21.....	926	22.86	462	125		45	2	4	3	23	11		170		
St. Louis, 500,000—4 weeks ending Sept. 21.....	543	14.11	228	55		25	1		9	5	7	57	54	6	24
Chicago, 460,000—4 weeks ending Sept. 28	611	17.27	334	55		26	11	1	19	17	28	4	86	2	58
Baltimore, 350,000—4 weeks ending Oct. 5.....	486	18.11	228	84		19	8		16	3	13	12	22	1	30
Boston, 363,000—4 weeks ending Sept. 28.....	509	21.51	295	90		25			4	12	18		153	3	
Cincinnati, 280,000—4 weeks ending Sept. 28....	376	17.55	157	46		10	44		9	3	5		19	2	24
San Francisco, 300,000—month of August.....	344	13.05	117	50		28	1		1		21		17	4	22
New Orleans, 210,000 - 4 weeks ending Sept. 22..	2665	47.27	776	88		5		1			*	230	34		36
Washington, 160,000—month of August	425	40.36	232	68		2	8	1	2	4	10	8	92		
Pittsburgh, 145,000—month of September.....	235	21.	101	17	3	81	6			4	13	2	20	3	14
Newark, 126,000—.....															
Providence, 100,000—month of September.....	142	17.04	45	32		13	2			7	8		7		
Richmond, 77,000—4 weeks ending Sept. 28.....	118	19.97	56	19			9		1		3	1	8		14
New Haven, 60,000—month of September.....	71	14.2	28	13		5	3		1		3	1	4		2
Charleston, 57,000—5 weeks ending Oct. 5	157	38.47	78												17
Milwaukee, 123,600—month of July...	170	16.	43	13	1	4	3		3				12	4	14
Mobile, 40,000—month of August.....	74	21.78	18	11							1		2		9
Dayton, 36,000—5 weeks ending Oct. 3.....	41	14.40		8		1			2			3	2		
Nashville, 27,000—month of September.....	55	24.36	16	5		1					4	2	2		
Wheeling, 28,000—.....															
Buffalo, 170,000—.....															
Rochester, 70,000—month of September.....	111	19.69	43	14		4	1			1	4	1	7		9
Paterson, 40,000—month of August.....	92	27.86	42	11		3	2			2			13		
Petersburg, 20,000—..															
Selma, 8,000—.....															
Elmira, 20,000—month of September.....	38	23.11	15	4		20							3		3
Yonkers, 18,500—.....															
Memphis, 45,000—.....															
Detroit, 125,000—.....															
Syracuse, 60,000—.....															
Reading, 40,000—										1					
Sacramento, 25,000—month of August.....	32	15.06	8												
Minneapolis, 44,000—month of August.....	60	16.04	36	5							2		26		
Bowling Green, 6,000—.....															
St. Paul—.....															
Cleveland, 162,000—4 weeks ending Sept. 21....	234	18.77	117	14		56	3		4		7	2	34		15
Erie, 27,000—month of Aug.....															
Jacksonville, 10,000—.....															
New Brunswick, 16,660—30 days ending Aug. 14.	20	14.12	12	1		2				2			1		
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Correspondents under this head are particularly requested to forward their communications *regularly*.

* Yellow fever, 1868; Typhoid and Typhus Fevers, 24.

Literature.

Transactions of the Medical Association of Georgia.—Twenty-ninth Annual Session, April 17–19, 1878. 8vo, pp. 279. An excellent volume throughout; comprehends: President's Address, William O'Daniel, M.D.; Annual Oration, William R. Burgess, M.D.; Amputation of the Leg for Necrosis, B. R. Doster, M.D.; Report of Cases, T. F. Walker, M.D.; Tubercular Meningitis, George I. Grimes, M.D.; Yellow Fever—the Epidemic of 1876 in Savannah, J. C. Le Hardy, M.D.; Neuralgia and its Modern Therapeusis, James B. Baird, M.D.; Strabismus, A. W. Calhoun, M.D.; Report on Gynecology, A. W. Griggs, M.D.; Psoriasis non-Syphilitica, S. H. Stout, M.D.; The True Physician, Thos. S. Powell, M.D.; Applications of Pressure in Diseases of the Uterus, V. H. Taliaferro, M.D.; Pith of Dried Cornstalk as a Uterine Tent, and General Remarks on Uterine Tents, W. T. Goldsmith, M.D.; Reports on Surgery, A. A. Smith, M.D., and J. T. Johnson, M.D.; Diagnostic Value of the Soft Palate as Compared with the Tongue, Wm. Abram Love, M.D.; Tar-Bandage, C. R. Leitner, M.D.; Hiccough, J. B. Roberts, M.D.; Necrology: Samuel S. White, M.D., E. J. Kirkscey, M.D., James Fort Bozeman, M.D., and Moses T. Fort, M.D.

Dr. Le Hardy's paper on Yellow Fever, giving a carefully observed history of its causes, as it appeared in Savannah in 1876, is especially opportune as an example for consideration in comparison with the conditions which have obtained in the progress of the epidemic in other places this year. Whatever difference of opinion may exist among different observers in regard to the essential nature of yellow fever, there can be no difference in regard to the great importance of the local and climatological conditions which commonly obtain at its inception. Dr. Le Hardy's is a particularly valuable contribution in this direction.

While he professedly limits his observations of the fever to the epidemic in Savannah in 1876, he gives, nevertheless, an interesting summary of the history of previous epidemics, and shows the similarity of conditions common to it independent of importation, which he does not believe to be necessary, though it may be sometimes instrumental, to its rise and spread; the local and climatolog-

ical conditions, so far as Savannah is concerned, being, in his judgment, sufficient to account for it without importation. Hence he believes quarantine should be abolished "as but a relic of dark ages," and for it should be substituted "*modern scientific disinfection*, which, in a few hours, will remove all causes of infection from any ship or closed vessel without hampering commerce." From which it is to be inferred Dr. Le Hardy's ideas of quarantine are limited to the quarantines of the "dark ages," and that he does not comprehend a quarantine of cleanliness, disinfection, and the care of the sick as being promotive of both health and commerce—such a quarantine as the law provides, and which has been practised for the last half dozen years at the port of New York.

For prevention of yellow fever "*drainage* is the simplest, cheapest, and surest means of preventing *paludal* fevers," or, to use the words of the Committee of the State Board of Health, "the low grounds surrounding the city as with a cordon of malarial influences should be thoroughly and systematically drained, at whatever cost." It is melancholy to observe in this relation, however, that the Georgia State Board of Health is rendered practically inoperative by the short-sighted parsimony of the Legislature.

Most of the other papers in the volume are eminently practical in the treatment of disease, and highly creditable to their authors.

Transactions of the Medical Association of Alabama—The Report of the State Board of Health. 1878. pp. 315.—While this volume is about equally divided in its twofold aspects of practical and preventive medicine, it is particularly interesting to observe the vein of the latter, which pervades the whole, and the special pride of the Association in its distinguished honor, as the keeper, protector, and promoter of the State's health. State medicine is here made practical in an eminent degree, and with a reciprocal benefit to both the State and the medical profession, which other States not yet provided with State Boards of Health and State Medical Societies would do well to profit by.

"The Sanitary Needs of Alabama," the subject of the Annual Message by the President, Peter Brice, M.D., is admirable alike for its clearness of appreciation of the subject, and for its comprehensiveness. He summarizes the provisions in the new Constitution of the State, the laws relating to the practice of medicine, and the applicability of the provisions and laws to every member of the Medical Association, in a way well calculated to stimulate every member to a full recognition of the honor conferred by the State, and the necessity of maintaining it.

Under the special head of "Sanitary Dissertations and Reports" follow the Annual Oration on the "New Era in Medicine," by Ben-

jamin H. Briggs, M.D., who gives a sketch of modern medicine, urges the general adoption of State Boards of Health, and a National Bureau. "The Value of Health to the State," by George A. Ketchum, M.D., consists for the most part of a recast of Dr. A. L. Carroll's paper on Preventable Sickness, and Pettenkofer's papers on the Value of Health to a City, heretofore published in THE SANITARIAN,* and applied to the State as an admirable basis for State Medicine, in its economical aspects. Jerome Cochran, M.D., contributes papers on "Hermaphroditism," and "What is Puerperal Fever?" The former is chiefly valuable for its historical succinctness and physiological accuracy—the subject hitherto not having received the special attention to which it seems to be entitled in relation to the problems of modern biology. The latter is an erudite upsetting of opinions on diseases better known by name than nature. He holds that as puerperal women are liable to simple inflammations and specific fevers which always remain true to their specific types, the term puerperal fever has no distinct connotation, tends to confusion, and should therefore be altogether excluded from medical terminology. And for the same reason he would also exclude surgical fever as in like manner tending to confusion and corresponding to no definite malady.

"The Ophthalmoscope and its Uses," by W. H. Sanders, M.D., has but a single paragraph applicable to sanitary matters—that which refers to the utility of the instrument in discovering myopia and hyperopia in children; it is a good paper on the ophthalmoscope in practical medicine, but omits a good deal which might have been said in its application to preventive medicine. "Endomatritis," by W. H. Johnson, M.D., is an excellent practical paper. The disease is chiefly attributed to exposure to cold, or getting the feet wet, the imprudent use of cold water injections, excessive fatigue from too long walking or standing while "unwell," and the too constant use of treadle sewing-machines. The pathology, diagnosis, and treatment are also given in a manner which shows thorough familiarity with the subject.

"The Atlantic Islands as Resorts of Health and Pleasure†" is a timely book for invalids and other persons contemplating a change of climate. The Atlantic Islands have been growing more and more into favor for several years, and, scattered through magazine and newspaper literature, much has been written concerning them. But until now no guide-book has existed giving

* Vol. III., pp. 337, 403; Vol. IV., pp. 17, 149.

† By S. G. W. Benjamin, Author of "Contemporary Art in Europe," etc. Large 12mo, pp. 274. Illustrated. New York: Harper & Brothers.

a comparative and comprehensive statement of the advantages of such islands, whether as winter or summer resorts. Together with a wise discrimination in including such islands only as are free from the visitations of yellow fever and other malarial epidemics, the author has taken much care in giving correct sanitary statistics, from official and other sources, of great utility; and, in an appendix, copious information regarding the attractions of each island for invalids and sportsmen, the means for reaching these resorts, the hotel accommodations, and expense of living. The work is gotten up in that usually attractive form common to the Messrs. Harpers' publications, and will doubtless obtain that which it well merits—the attention of all tourists and others interested in the Atlantic Islands.

Sanitary Examination of Water, Air, and Food,* supplies a much needed want on a very important subject. While much has been written on these subjects, it has been the misfortune of sanitary officers not to have had any single work which so grouped the various analyses and examinations as to render them readily accessible and practicable. The author makes no pretensions to originality as an analytical chemist; but as an analyzer of what analytical chemists and others have done, which may be used as torchlights in the prosecution of sanitary work, few books possess more originality or better adaptation to the object in view. It is the most valuable hand-book on the subjects of which it treats hitherto published.

Gray's Anatomy† has been so long recognized as the best text-book on anatomy published, that it seems to be little more than necessary to announce a new edition with all modern improvements. But this new American edition, from the eighth English, is something more. It has been carried through the press under the careful supervision of Dr. Richard J. Dunglison, who has made

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* Sanitary Examination of Water, Air, and Food; a Hand-book for the Medical Officer of Health. With illustrations. 12mo, pp. 508. By Cornelius B. Fox, M.D., M.R.C.P. London, Medical Officer of Health; Fellow of the Chemical Society, of the British Meteorological Society, of the French Society of Hygiene, etc. Philadelphia: Lindsay & Blakiston. Price $4.00.

† Anatomy: Descriptive and Surgical. By Henry Gray, F.R.S., Fellow of the Royal College of Surgeons, and Lecturer on Anatomy at St. George's Hospital Medical School. With an Introduction on General Anatomy and Development. By T. Holmes, M.A., Cantab., Surgeon to St. George's Hospital, etc. A New American from the Eighth English Edition. To which is added *Landmarks: Medical and Surgical.* By Luther Holden, F.R.S., Surgeon to St. Bartholomew's and the Foundling Hospitals. Large 8vo, pp. 988. Elaborately illustrated. Philadelphia: Henry C. Lee.

considerable improvements in the typographical arrangement, by which the volume is rendered more convenient for consultation and reference. The introductory section, especially, has also been improved by a few new illustrations; these are distinguished by brackets; and the publisher has added an appendix—"Holden's Landmarks: Medical and Surgical"—which, in the briefest possible compass, affords just that kind of topographical anatomy which is essential to every practitioner in his daily practice. Equally as text and reference book it is the best of standard works for both student and practitioner. The publisher's part of the work is in keeping with the text: paper, type, cuts, and binding are all excellent.

Rectal Medication, an Essay by William Bodenhamer, M.D. —a strongly bound pamphlet of fifty-eight pages—recently published by Messrs. Wm. Wood & Co., New York, should be in the library of all physicians. It admirably summarizes an important subject, which is worthy of more attention than has hitherto been given to it.

Important Medical Works Soon to Appear: Wood's Library of Standard Medical Authors. Messrs. Wm. Wood & Co. announce that in January, 1879, they will begin the publication of Medical books by the most distinguished modern and standard authors, in monthly volumes of from 200 to 300 pages and upwards, handsomely and strongly bound, at the merely nominal price of one dollar each. Estimating from the regular prices of the books so far selected for publication in 1879, subscribers to this Library will obtain about *fifty dollars' worth of Medical books for twelve dollars*, but by *subscription only*, at twelve dollars a year, payable in advance.

The following will be published in 1879: *Rest and Pain*, by John Hilton, F.R.S., F.R.C.S.; *Diseases of the Intestines and Peritoneum*, comprising articles taken from Reynolds' "System of Medicine." These articles will make a volume in this Library of about 250 pages, with numerous illustrations. *Diseases of Children*, by Edward Ellis, M.D.; *Diseases of Women*, by Lawson Tait, F.R.C.S.; *Diseases of the Liver*, by Dr. Fried. Theod. Frerichs; *Infant Feeding and Its Influence on Life*, by C. H. F. Routh, M.D. Titles of the remaining four volumes for 1879 will be announced later in the season.

Mr. Henry C. Lea, Philadelphia, announces for early publication: *The National Dispensatory*, by Alfred Stille, M.D., LL.D., Ph.D., and John M. Maisch, Ph.D.; *Clinical Manual for the Study of Medical Cases:* For the use of Students and Practitioners of Medicine, by James Finlayson, M.D.; *The Principles and Practice of Surgery*, by John Ashhurst, Jr., M.D.; *The Principles and Practice of Gynæcology:* For the use of Students and Practitioners of Medicine, by Thomas Addis Emmet, M.D.; *The Practice of Surgery*, by Thomas Bryant, F.R.C.S.; *A System of Human Anatomy:* Including its Medical and Surgical Relations. For the use of Practitioners and Students of Medicine, by Harrison Allen, M.D.; *Manual of Pathological Histology*, by V. Cornil, Professor in the Faculty of Medicine, Paris, and L. Ranvier, Professor in the College of France. Translated, with Notes and Additions, by E. O. Shakespeare, M.D.

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HOT-AIR, ELECTRIC, AND ROMAN BATHS.

By E. C. Angell, M.D.

"Medication without hygiene is like amputation without ligatures."—*Oliver Wendell Holmes, M.D.*

Ancient history, from its most treasured resources, recalls from the past few topics of greater interest or of greater importance than sanitation through the agency of the bath. Nature in this was the great teacher, and necessity was then, as now, the mother of invention.

Thermal springs, which were widely diffused, were no less significant than suggestive; and cleanliness, in all ages and in all countries, has been no less a luxury than a positive necessity; and the recognition of this fact has ever been an index of health as well as intelligence.

The estimation entertained of hot air in many of the older capitals of Europe is attested by the architectural structures that adorn Athens, Alexandria, Bagdad, Cairo, Constantinople, Damascus, Smyrna, and many of the cities of Italy. The ruins of Herculaneum, of Pompeii, and of Rome assert at once the grandeur and supremacy of the bath in the past. In fact, every country that at any period of the world's history owed allegiance to the Roman Empire, and over which the Roman legions took their way, retains enduring monuments that declare unmistakably that this people respected health; that they studied the laws of self-preservation; and, whether in crowded cities or tented fields, the bath and they were inseparable.

When Constantine abandoned the dirty Tiber, and took possession of Constantinople and gave it the name it has since retained, he built hot-air Roman baths as well as palaces, and brought marble from Egypt and statuary from Rome, and sought to invest the new metropolis with all the glories of the old empire. When in subsequent years this gem of the Orient fell into the possession of the Turkish vandals, they destroyed nearly every trace of the baths of the Romans. They have since, however, erected in their stead imitations, though somewhat rude, that afford an example well worthy of imitation by the Christians at Rome; where the baths of Agrippa,

of Caracalla, of Constantine, of Diocletian, of Titus, and of other emperors are grand, gloomy, and peculiar in dust and decay. May these baths be restored, and may a brighter destiny dawn upon the eternal city, and may the light of sanitary science dispel the mephitic, the miasmatic gloom that has hung over her destinies like a cloud of devastation and death!

Great Britain, like other countries, while under Roman domination, received and still retains many monuments of Roman architecture, among which the bath occupies a by no means insignificant position. After the abandonment of the bath for nearly the full period of two thousand years, thanks to the eloquent efforts of David Urquhart, who learned its advantages and benefits of the Turks, it was again restored, with many, if not most, of its Turkish defects, to its former British home. It is a little more than twenty years since its restoration; and even now there is hardly a town in England, Ireland, Scotland, or Wales too poor or too rich to do it reverence. In fact, Turkish baths in Great Britain may be numbered by thousands, and yet their construction, their administration and possibilities, are quite indifferently understood, even by those who claim to be well informed.

It is about fifteen years since the hot-air bath found its way to this country, and it has already extended to Boston in the East, and to San Francisco in the West, between which points there are few of our cities that do not boast of their hammams. Some of the most costly and expensive of these structures have copied the faults which the English copied from the Turks, and some of them have adopted original methods that have conferred positive and peculiar advantages and benefits.

It is my impression that I cannot do the cause of sanitary science better service than by stating, as briefly and as concisely as possible, how a complete bathing establishment should be constructed, and how and under what circumstances these resources of hygiene should be administered.

The situation should be well drained and dry, and should be accessible as well as central; and it should be such as to secure not only abundant light, but abundant sunshine. In fact, the sun should be freely admitted into every apartment and department. Health of body or mind long continued without sunlight is an impossibility; and a dark bath is an abomination, and should be avoided, detested, and deserted.

The first stage of the bath commences with disrobing; and the dressing or disrobing room should be cleanly, cheerful, comfortable, light, sunny, and well ventilated, and furnished with couches on which the bather may repose before or after the bath, as may be desired.

The hot chambers should be three in number, varying in temperature from moderate to intense, and in addition to being sunny should be dry and devoid of vapor, sensible or insensible, as vapor is as incompatible with perspiration as it is with ventilation. These chambers should be carefully, completely, and continuously ventilated. There should be a free entrance for fresh air, and an equally free exit for foul air; and heat should be employed as a mode of motion,

as air is ponderous and will not move without assistance. To this end there should be a constant and continuous supply of heat day and night greatly in excess of immediate necessity, that the excess may serve to secure and supply constant as well as complete and continuous ventilation. The temperature of the first room in moderate weather should range from 150 Fahrenheit to 170, the second room from 175 to 200, while the third room should stand at 212, and in cold weather, or for emergencies, should be so arranged that a temperature of 250, or even 300, can be readily established. It is not often in health that temperature in excess of the boiling-point will be desired, but there are abnormal conditions in which higher temperatures are indispensable to successful results.

The heat should emanate from a brick furnace remote from the hot chambers. The radiators should be placed in the third room, and should be of wrought iron. They should be so constructed and provided with valves that a large or small amount of radiating surface may be employed as the season or the situation may require. These tubes expand and contract with such uniformity that close joints are always maintained, which is not the case with radiators made from fire-brick or clay pipes, and which are liable to emit ashes, dust, gas, and smoke.

By this system of direct radiation the heat is thrown off, received and absorbed by the skin much as the sun's rays are received and absorbed, and is much more efficacious and invigorating than heat received by transmission.

The shampooing-rooms should be apart, and separated by halls or corridors, that the vapors arising from soaping, spraying, and showering may not reach the hot chambers. To accomplish this it is not enough that they should be distinct and separate, they must also be carefully, completely, and continually ventilated, or the vapor from these apartments will find its way to the hot chambers, and damage, and demoralize, and frustrate their efficacy and usefulness. As a rule, a bathing establishment having three hot chambers should have four shampooing-rooms, that bathers may not be hurried in the process of shampooing, or that others may not be compelled to remain too long in the heat. They should be provided with couches, floors, and walls of marble. They should be well warmed, and supplied with douches, showers, and sprays.

The swimming-bath should be situated in a well lighted, well ventilated apartment, and should have sufficient depth, breadth, and length for diving as well as swimming, and should receive a constant supply of fresh water, which should be kept as cool as the temperature of the water supply will permit, that this element may be suited to all seasons. This indispensable feature of a complete bathing establishment is unknown among the Turks, though extensively employed by the Romans. To the athletic it affords opportunity for exercise and invigoration; it also affords the best means of acquiring the accomplishment of swimming.

The baths of the Turks have no ventilation, and they have other faults which would be "more honored in the breach than in the observance." They have transmitted to Great Britain the mistake of constructing baths without adequate ventilation, and of sham-

pooing, splashing, and showering in the hot chambers; by reason of which the air is made moist and depressing, if not scalding, to such an extent that, as a rule, it is almost impossible to remain long enough to be in any sense benefited. The truth is, the longer a bather remains in such a place, the worse it will be for him, and the less ability he will have to get away.

The damaging and depressing effects of badly constructed bathing establishments are not only abundantly illustrated in this country, but it was well exhibited in Constantinople in the last vist the cholera made to that metropolis when the *Cordon Sanitair* closed all of the public baths, and interdicted their employment. Had they been well constructed and well conducted, they would have been among the most efficient allies in the cure as well as the preventive of that depopulating scourge.

The cooling stage of the bath is hardly less important than the hot stage, and if this is improperly conducted, or the rooms are improperly constructed, the benefits of the bath may be frustrated and the bather may be injured more than benefited. These rooms should be spacious, light, sunny, and well ventilated, and great care should be taken that they are not too warm. The bather should be instructed to move about and enjoy the intense invigoration which comes only from a bath in cool air, the benefits of which were discovered, described, and practised by that great American philosopher, Dr. Benjamin Franklin. At this stage of the bath the mistake is often made of rolling the bather in blankets, the effect of which is in many instances to induce renewed perspiration and to establish increased susceptibility and unfitness for the outer world. The invalid who is easily exhausted may properly repose, and even sleep, after the bath with great benefit; and those who are particularly sensitive and susceptible to climatic changes or exposure should follow the hot-air bath with the process of anointing and massage which forms the concluding stage of the complete Roman bath.

There are many cases and conditions in which the hot-air bath may advantageously be followed by the electric bath, if properly administered, and an apartment provided with a wooden tank should be set apart for this purpose. In this the bather reclines in agreeably tempered water, which is charged with the electric element, which is made pleasantly to penetrate and pervade the entire organization. By this means a large volume of electricity may be employed, and no shock experienced. After the general application, mild or intense currents should be locally employed as the case may require; and if the bath has been conducted with care and skill, the bather emerges exhilarated refreshed, and rejuvenated. A properly constructed and conducted electric bath is, in skilful hands, one of the most efficient means of exact diagnosis, and maps out with unerring accuracy, even in obscure affection, not only functional faults, but organic defects; and correct diagnosis is the first step to successful recovery. There are many cases and conditions in which this bath should follow the bath in hot air, which places the bather in the best possible condition to receive its highest benefits. As there are many circumstances and conditions in which hot-air or electric baths, or both, should be fol-

lowed by the process of anointing and massage, proper apartments for anointing are among the indispensable requisites of a completely appointed bathing establishment. These apartments should be light, sunny, retired, well tempered, and well ventilated, and large enough to contain a couch, on which the bather may recline, with room enough for an attendant to work on either side. Anointing and massage, when supplementing hot-air or the electric bath, embrace all the advantages of the most vigorous exercise, without exhaustion or fatigue, and affords the best protection against the changes incident to our climate, even in its most rigorous seasons. As a complete and successful bathing establishment should be accessible to gentlemen at all times and on all occasions, day and night, there should be a separate and distinct

Ladies' Department, which should be complete in all its accessories and appointments. There should be reception-rooms, waiting-rooms, dressing-rooms, heating-rooms, shampooing-rooms, electric and anointing-rooms, and cooling-rooms; all of which should be cheered by the sun, and warmed, cooled, heated, and ventilated by the same system employed in the main department of the establishment. If there is any difference, there is greater necessity for the employment of hot-air, electric, and Roman baths for ladies than for gentlemen. By want of air, in-door life, and the absence of light and sunshine, and little exercise, they become in too many instances an easy prey to mental depression and impairment, as well as physical prostration, with such extreme sensibility and susceptibility that they shrink and shiver at the thought of cold air, and they regard night air as their deadliest enemy. They have only to employ these allied sanitary agents to become healthy, ornamental, and useful. They should be early taught the important truth that beauty and health are one and inseparable, and that good health is as certain to follow obedience to the laws of their organization as disease is to follow from transgression.

Conceding that we have a bathing establishment of faultless construction, which is a great concession, as such structures are exceedingly rare, it is next in order to consider under what circumstances, in what mode, for what purposes, and at what times these several resources of hygiene shall be employed; and why are they at all necessary? If we toiled in the field and earned our bread in accordance with the Scriptural declaration, which would give us active skins, there would be less necessity for the employment of artificial aids. It will not be questioned that all or most of even well-to-do persons breathe too much bad air; that they are too constantly housed. As a rule, they sleep in apartments indifferently or not at all ventilated. They eat too fast, too much, too often, and too many kinds of food. They employ too many condiments. They drink too many beverages. They take too little exercise, and are often improperly clad. They have obstructed skins, a condition common to those in affluent or even comfortable circumstances. In hot weather some of these people take kindly to the mountains, while many seek sea air and salt water, but at the approach of cold weather, when the skin becomes much more inert, and bathing is a much greater necessity, the bath is too often neglected or entirely ignored, until disease is completely developed.

The declaration that an ounce of prevention is worth a ton of cure should be traced in letters of gleaming gold and in colors of living light, that discomfort, disease, and untimely death may be averted. It is the function and purpose of hot air and its accessories and adjuncts to do this work to avert disease, to intensify health, to prolong life, to prevent untimely death.

Few persons of any class or condition are fortunate enough to reach adult age without more or less disease. Health is less a matter of chance than of education. Those who learn wisdom by the experience of others are indeed rare, and most of those who accidentally blunder into health or fortune, appreciate either only by their loss, and upon such persons admonition is wasted. All enjoying equally good health should not bathe alike. There should be a careful consideration of each case and condition. Individual idiosyncracies, organization, and temperament should be attentively studied, that the bath may be such as to secure the best results.

Those in health, who would become more rotund, should bathe often. They should remain in the hot chambers, however, only long enough to establish free perspiration; shampooing should then follow, without soap or water. The *exuviæ* that may have been thrown off, should be carefully removed with cotton crash—as linen is too hard and harsh. This imparts to the skin a grateful, glowing warmth. He should then promenade in the cooling room, and receive the exuberant exhilaration of a bath in cool air. If he follows with the process of anointing, and the searching massage that accompanies it, *Kokoleon* should be the unguent; and it should be applied in as large amount as the skin will absorb. At the conclusion of the massage none of the unguent should remain upon the surface. By the employment of hot air effete waste is rapidly eliminated, and a better system of nutrition is established; and as the absorbents act with renewed energy, it will be readily apparent that this is the proper time for the application of any proper unguent. This particular unguent has no inconsiderable value as a means of promoting nutrition, aside from its advantages as a lubricating agent and the more searching massage that it renders possible as well as profitable. By this means a thin man in health may, as a rule, gain one pound each day by the daily use of the bath as described, moderately exercising meanwhile, and employing a careful, consistent, and simple, non-stimulating regimen.

The man in health, having just the right weight, should bathe every week instead of every day, and should remain in the hot chambers long enough to establish free, but not excessive, perspiration; when he should be shampooed without soap or water, as in the case preceding; when he should dive into the pond if he desires, only to come out and cool in air, as already described. If he is to be anointed, the same unguent should be employed in as small amount as will serve for lubrication, and the effective massage that concludes the bath consistently and completely.

Contrary to the generally received opinion, the man in health who is too rotund is rather to be commiserated than envied; and however vigorous he may be, as a rule he is in imminent danger. Fatty degeneration is impending, and must be continually and con-

stantly combatted. Anti-fats and physics should be thrown to the dogs, and consistency in dietetics should be rigidly enforced and followed undeviatingly.

Acting in full accordance with these suggestions, and remaining each day in the hot chambers as long as he can without making it a matter of punishment, drinking water only and in the smallest amount that will satisfy thirst, and following the bath in hot air with soaping, showering, spraying, swimming, and cooling, when he should receive anointing with the most searching and thorough massage. The unguent should be *Romaleon*, and it should be used in as small amount as will serve the purpose of lubrication for complete and searching massage. In this way a stout man may lose three pounds daily, and greatly improve his chances for life insurance. In fact he can soon put himself in such condition that he can afford to assume his own risk.

The employment of these unguents tends to promote and to prolong the activitity of the skin, while at the same time they serve to check and repress undue perspiration, and are therefore preeminently strengthening.

Between health and disease there is usually an intermediate or transition stage, characterized by malise or general lassitude. Exhaustion succeeds upon slight exertion, and there is an annoying susceptibility to climatic changes; and though there is an absence of disease, there is general loss of energy as well as tone. A change of climate, if not of habits, is clearly indicated, and is the course most commonly commended by the conscientious, intelligent physician. Mountain air, with exercise in moderation, followed by absolute rest, would doubtless be of great utility. This, however, would incur considerable cost, and might occasion more or less discomfort, aside from its interference with business and social advantages, even if there are no family ties to interpose.

Alluring as are the promises of patent tonics, it is widely known that alcoholic stimulation is followed by corresponding depression, and these very nostrums are commonly instrumental in establishing the state of facts with which the sufferer and the physician have to contend. We need not go far, however, for a change of climate, and if the season is favorable the use of the sun-bath, with simplicity in diet, with the absence of other stimulation, succeeded by refreshing sleep in apartments thoroughly ventilated, will be found to confer benefits that can be derived from no other source with equal certainty and rapidity. Hot air, however, which affords a radical change of climate, is ready at all times, upon all occasions, and at all seasons; and next to the sun is unquestionably the most potent agent at our command. It may in fact be considered bottled sunshine, and is equally available day or night, whether clear, cloudy, or stormy.

There are characteristic and distinctive modes of administering these hygienic agents in health, and special and specific modes in applying them in the treatment of disease.

Among the most common maladies that seek and find relief from these resources may be mentioned asthma, bronchitis, catarrh, dyspepsia, hay fever, gout, insomnia, intermittent fever, lumbago,

neuralgia, rheumatism, and sciatica. These are all maladies that in their acute or chronic forms occasion a large amount of discomfort, even as single enemies; but when they come associated, the way of the transgressor is hard, and, hard as it is, comparatively few persons reach the age of fifty years without encountering them all. It is, in fact, common to find several of these allied enemies associated. There is only one rational mode of treating these disabilities. It is not by temporizing and by palliating symptoms; it is simply by the employment of constitutional measures that seek to remove the cause. All other efforts, strictly considered, are little better than criminal, as they are calculated to augment and continue, rather than diminish and dissipate, discomfort and disease.

In the early stage of any or all of these disorders, if the season permits, direct exposure to the rays of the sun, toiling in the field or meadow, or sleeping out-of-doors, with simplicity in diet as well as the absence of stimulation, will be found to afford most certain benefits. If the season does not admit of this exposure, hot air comes to our aid, and if supplemented with the electric bath, carefully and intelligently administered, and this is followed by anointing and artistic massage, the benefits will be as certain and almost as speedy, permanent, and prolonged, as can be acquired by solarization at its best season and under the most favorable circumstances.

These are maladies that are easily augmented if neglected, and they cannot, as a rule, be combated without cost. What, indeed, is cost in comparison with health? Millions will not purchase it. What is wealth without health? No man can take his fortune with him "to that bourne whence no traveller returns," and no man can long enjoy anything who suffers from accumulated and accumulating maladies.

This is an age of unusual intelligence, of rapid communication. It is an age in which many men have learned to seek health for themselves in a better understanding of the laws of life, as well as the mode of treating disease; which should not only look to the eradication of the malady, but to the means of promoting and prolonging health as well as life.

Every man has literally his life in his own hands. The trite maxim that "every man is a fool or a physician at forty" was perhaps never more significant than now, and the doctor enjoys the unique distinction that he may be both.

The profession at large is too heedless of sanitary matters. They do not comprehend, preach, practise, or understand hygiene. It is something they have not studied. Their attention has been given to anomalies, to morbid anatomy, and to monstrosities. They have in too many instances lost their interest in health, and are rather delighted with disease and deformities.

We well might learn wisdom of the Celestials, the descendants of Confucius, where the physician is paid while the patient is in health, the pay being stopped when disease is encountered.

In dry, hot air, in well ventilated apartments, the rapid evaporation from the surface cools the blood, which at the same time is literally washed of its impurities. The skin gives off an excessive amount of carbonic acid gas, and in the well ventilated bath receives

oxygen instead, by which means the blood is ærated and vitalized through the skin as well as the lungs. In vapor the moist air condenses upon the surface and acts like a coat of varnish, hindering perspiration. As a consequence the blood is raised in temperature and circulated with preternatural rapidity, while its impurities are retained, and congestions are the rule rather than the exception. Such a result inevitably follows the heating of the blood and the sudden cooling by plunging into cold water. The fact that cold water is grateful after excessive heat does not necessarily make it salutary. In dry heat the blood is not raised in temperature as in vapor, and the plunge may be employed and no violence will be encountered.

The question as to the best time to employ these agents may properly be considered. The man of business or leisure, who can command his time as he chooses, should by all means bathe before breakfast. This interferes the least with business as a general rule; and the bath is not only the best preparation for breakfast but for the duties of the day, however arduous they may prove. The best time for the invalid, as a rule, is some two hours after breakfast. Those whose business will not permit them to bathe in the morning or at midday will find the bath an effectual means of rest from fatigue, and the very best preparation for dinner. Those who suffer from wakefulness should bathe just before retiring as a means of securing the most refreshing repose and soundest sleep.

Some of those who have followed me attentively to this point may have arrived at the conclusion that I have come to regard these several resources of hygiene as so many panaceas for a given number of ills. This is more than I claim. As a rule, these agents do not cure, they simply remove the impediments to health, and disease has no longer a resting-place in the vital domain.

The benefits of these allied sanitary agents are by no means restricted to the maladies I have mentioned. Most forms of paralysis are greatly benefited, and those who devote their whole attention to diseases of the eye and ear find in these agents efficient aid and coöperation.

The general surgeon who comprehends and enforces the laws of hygiene will be the most successful practitioner, and from this source these sanitary agents receive the heartiest coöperation and the widest recognition.

The functions of the skin are too important to be ignored. When we consider how large a share of the fluids and solids that enter the body should find their exit by this great emunctory, together with broken cells, morbific waste, and disintegrated tissue, all of which by obstruction of this organ is thrown back to poison the whole man physically, mentally, and morally, we have at once the key to much of the misery that afflicts our race.

Suppose, for instance, the conduits that drain our city and remove the waste from its dwellings are obstructed, how long could the occupants remain in the most palatial mansions. They would have to abandon their homes, or be confronted with disease and death. Every person with an obstructed skin is in similar jeopardy, and

the obstruction must be removed, or he must retire from the house he lives in.

Perspiration is the safety-valve of the heart, and the sewer of the excretions; and hot-air and its accessories, properly applied, are not only the best protection against disease, but they are among the most efficient means of prolonging life and of protection against unnatural and untimely death; and in the same proportion that we build with intelligence sanitary structures, and employ them, we may dispense with hospitals and invalids; and in the same ratio we shall prolong useful lives.

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The Sanitary Condition of Paris.—The *Progres Medical* for June 22d contains a summary of the Report of M. Besnier on the diseases prevalent in Paris during the first quarter of the present year. The greater part of the Report is devoted to the study of contagious diseases, and the isolation of those suffering from them.

Diphtheria, in accordance with a law of development peculiar to it, and which was stated in a previous report, has become a permanent disease, being most severe in winter. It reached its lowest point during the first quarter of 1878. The mortality was somewhat less than for the same period of 1877—703 deaths instead of 728. Still it cannot be said that the disease shows any signs of permanent abatement. The number of admissions to the hospitals has been 246 instead of 265, and the number of deaths 188 instead of 220, in the same period of the preceding year.

Small-pox reached, in 1873, the lowest point it has ever attained. From 1874 to 1877 it increased steadily; since this last date it has been on the decline, and during the first quarter of 1878 it returned exactly to the point it reached in 1873. The following are the deaths in Paris yearly during the first quarter from 1872 to 1878: 32, 6, 4, 43, 102, 67, and 6 respectively. These figures cannot be explained by supposing that the susceptibility to the disease was destroyed among the people by the epidemic of 1870; for, besides the fact that the period is remote, it must not be forgotten that there has been an immense immigration into Paris since that time. There is no doubt that small-pox is subject to variations like all other zymotic diseases, in which the power of the contagion is essentially united with certain peculiar local conditions which influence its changes, and which constitute the very essence which makes it a sporadic or an epidemic disease. This fact seems to be further confirmed by the difference between Paris and London in the number of cases of scarlatina, notwithstanding the constant travel between the two countries, and the interchange of merchandise favored by easy and rapid means of travel and transportation of goods, and the further fact that scarlatina is one of the most active, the most virulent, and the most easily transportable diseases, either by the person or fomites. Yet in 1877, there were only 103 deaths from scarlatina in Paris, while in London there were 1,576. Besides, in the Paris hospitals there is, practically, no isolation in cases of scarlatina. It would seem, then, that isolation may be neglected, at least temporarily, in this disease; but in the case of measles, isola-

tion is as imperative as in cases of small-pox or of diphtheria, and even more so, since measles contracted in the hospital by children suffering from other diseases, or exhausted by severe and protracted illness, is very fatal.

The Report brings out the further fact that isolation is very necessary in cases of parotitis occurring in adults, and especially so in military hospitals. This disease, which is not very communicable, nor generally very serious in children, seems very different in adults. Of 305 cases affected with fever admitted into the military hospital Saint Martin, during the first quarter of 1878, there were 30 cases of parotitis, of which 9 were complicated with orchitis. M. Besnier directs the attention of military surgeons especially to this subject.

The concentration of cases of contagious diseases gives rise to no danger for the patients, nor for the neighborhood within a determined distance. When two contagious diseases, as scarlatina and diphtheria, exist at the same time in one patient, such patients ought to be placed by themselves.

The proper isolation of contagious diseases is most intimately associated with public hygiene. And this practice does especial honor to the medical profession in Paris. No question has been more fully discussed than this, and no one person has done more to promote the public welfare in this respect than the Secretary-General, M. Besnier, in the Reports of the Committee on Prevalent Diseases. The medical profession has urged the people to look to their own interest in this matter; but there seems to be no question in which the people take less interest than in the preservation of their health. Paris is not peculiar in this respect; the authorities in our large cities, not satisfied that people should die from natural causes only, create the means of spreading disease, and behold without remorse thousands of people dying from these causes whose lives ought to be saved to the community; children on whose preservation the future depends, and skilled workers on whom the present relies for support.

Another inference may be drawn from this Report, as well as from other sources: Health Boards must not think that because a given year offers fewer deaths from small-pox or other zymotic diseases, that they have effectually overcome the formidable enemy, boast of the great success they have had where, perhaps, their predecessors in the same office seemed to be unable to stem its progress, nor fold their arms and flatter themselves that their victory is complete. It may raise its head again when they least expect it, and with increased virulence. T. P. C.

Typhus Fever in St. Petersburg.—According to the Russian journal *Public Health*, the commission appointed to inquire into the extent and progress of the epidemic, found on the 9th of April, in all the hospitals of the capital, 3,730 cases of typhus fever. Of these cases 1,657 were attacked with typhus exanthematic; 761 with abdominal typhus, 1,196 with recurrent typhus, 1 case with bilious typhus, and 115 cases had certain special characteristics entirely unknown heretofore.—*Gazette Médicale de Bordeaux.* T. P. C.

PUBLIC PARKS: THEIR MORAL INFLUENCE.

By E. Seguin, M.D.

A paper read before the New York Academy of Sciences, October 28th, 1878.

No nail needs so much hammering as a new idea. The new idea which I mean to hammer here for the third time* is that of keeping sacred the public grounds and parks of the City of New York—indeed, all the cities', States', and national grounds—and of preparing and using them as means of hygiene, education, art, and moral elevation of the citizens of this Republic.

There is, far from this plan, the pertinacity with which the trustees of this commonwealth have been stealing its treasures, have plotted the destruction of the Washington play-ground, and are now bartering away the site of the Battery, that oldest of the historical grounds, gate of honor of the city; therefore I say to the population ignorant of this new crime: *Sursum*—the nail to be hammered till it enters the thickest skulls.

Therefore I have to present you again the question of the city parks in their relations to health, to education, and to their moral influence.

Your interference in favor of the integrity of the Washington Park had been preponderant in saving this play-ground and *solarium;* but you had hardly gone to your summer vacation when another aggression was made, not only on the most ancient of our parks and the inalienable property of the city, but against the imprescriptible relations of New York with its harbor, if it is true that nature prepared this harbor so that the young metropolis could see itself in its Southern waters—a peerless beauty before a faultless mirror. Unfortunately, the ledges of this unique panorama have gradually been invaded on the city front by structures which would have done duty just as well farther on the right or left.

(1) In front, towards the west, the Castle Garden, once a simple terrace, has become an emigrants' shed, which obstructs the view. When it burned, it could have been removed to some of the many side-piers which beg in vain for a structure and something to do under it. But it is in front, and toward the east, that the obstructions have accumulated.

(2) The smallest of all belongs to the Associated Press.

(3) Then the building of the Governor's Island Ferries.

(4, 5) The two Staten Island Ferry buildings.

(6, 7) The double and large structure covering the Hamilton and South Ferry piers.

(8) The low, ugly Hudson River Railroad stores.

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* "Our Parks for Garden-Schools." A pamphlet by E. Seguin. Published by the Society for the Protection of the Parks. 1878.

These obstructions form a barrier behind which none can suspect how near the ocean displays its ever-changing scenes; they make that part of the city so dreary that people avoid it, unless to reach the ferries. Even the trees suffer.

In virtue of what stipulations, conquests, acquisitions, or otherwise, have these frontages been taken possession of, and so walled that it is the sea itself which seems to be prisoned? That does not matter presently, because there is no right against public rights, says the *Jus Romanum*, and that the right of the people is worth legally fighting for, even unjustly paying to recover it.

Therefore, setting aside the obscure rights of property to this frontage, let us see a new peril. The general government is said to possess an empty plot of ground adjoining the Associated Press landing; and officials, who have horror of the vacuum, proposed to build on this lot a Custom-house office. The lot was soon found too narrow, and the guardian of the city interests, instead of entering a protest, comes forward offering to give or sell (little difference) an adjoining water-front which belongs to the city. And now, who will deny that before this barge-office be half erected new front-lots will be said to be necessary for its completion, and will be granted, of course. Then shall be completed the severance of this city from its harbor, and the shocking contrast of a harbor unequalled in majesty and activity, and of a city masked with barracks; no monument, no air, no perspective; a violence to the eye, a humiliation to patriotic pride.

We would not have touched these sullied questions, were not their preconcerted solutions threatening the things dearest in civilization, viz., the health of the citizens, the education of the children, the sense of the beautiful in the masses, and that of innate reverence to the natural scenery for which London, Paris, and Rome envy New York in vain. I would not say more, to not aggravate the offence which right inflicts to wrong when it speaks the truth. For then woe to whom is right! only that this whole shore must present to the stranger the noble face of a great city and the welcome of a great nation. To that effect it must be made an entrance of honor to the rare guests of the city, its waves expiring in marble basins in front of the widened entrance to Broadway, perceptible through the trees; the groggeries on the left to be converted into a marine museum; the Battery planted to the water edge; and when the sea and land meet, the vegetation transformed from terrestrial to aquatic, will assume darker colors when it passes from the reefs to the depth, speckled with shells and anemones. But where the land is separated from the sea by stone ramparts, the latter will support subterranean aquariums, whose population may be more varied and rich in monsters of the main than Brighton's.

In the Battery so aquatized, I doubt not that the gull and other sea-birds would be enticed by marine decorations to come and rest from their long journeys, or remain, if taken very young or when enfeebled by age, being allowed to fish in clear basins in summer, and fed by some old salt in winter. I think so because, having brought to Paris a pair of "mouettes," they remained a long while in my little garden, contented and quiet among the low Bengal

rose-bushes, clamorous only once a day when they smelled the approach of the fish-woman. They never tried to go away, walked side by side, the female being invariably a little behind her gander; and when he died she refused her food and followed him.

The memory of these scenes, in which are mixed the features of a wife and child, is as vivid and touching to-day, if not more, than the sight itself, thirty-five years ago.

Will it be said that it is incongruous to support by such puerile evidences a cause argued to be of public interest? But what is of more public interest than the preparation in children of honest, natural impressions, which will aim out their life for its whole course toward human and artistic objectives? My personal excuse for advocating this course is my age. Old men can, better than young ones, bring forth these testimonials at long range of the influence of early impressions, because, having personally experienced them, they can corroborate their effects at large by their effects on themselves, and *vice versa.*

To continue: My next illustration is of the influence of scenery in shaping the course of many lives. I take it from the primitive and unobstructed view of the activity of this harbor; when all the ages and conditions met on the open Battery to greet the graceful entrance of ships expected or unknown, all bringing fortunes and news. Who dare deny that this sight—obstructed to-day—fired the hearts of the young to become great merchants, brave sea captains, and daring ship-builders; and that in the absence of these incentives viler motives would, or could have been, the movers of their ambition? Recent examples forbid to deny this.

Without leaving this spot we can see another illustration of the influence of early impressions which constitute the substratum of the sympathetic education on the direction taken by the American school of art. The sight of the ever-changing tableau of the New York Bay, and of the enchanting amphitheatre which frames it, has created these marine and landscape artists so justly rewarded at the last international exhibition at Paris, who are fifty years or more in advance of their competitors in painting genre and history.

To change scenery, and see if the same law holds good in different countries, I will borrow this fourth illustration from the "Pigeons of St. Marc," and speak *de visu.* A legend makes them descend from the messengers who brought to the Venetians the news of the battle of Lepanto, and gave them the time to send the reinforcements which insured the victory of that name. As a tribute of gratitude for such timely service a law provided for these messengers and their posterity at the public expense, and the city appoints yet an officer to take care of them. When this feeder comes every morning, surrounded by his hungry and confident birds, citizens and strangers to Venice mix in the crowd with their "cornet" of wheat, all the faces are illuminated with a ray of happiness, and timid girls experience a delightful sensation when the pigeons fight over their delicate hand for the grain it proffers.

Now suppose that the decadent Queen of the Adriatic be persuaded by her *factotum* to save the price of that unequalled red wheat of Trieste, and to make pot-pies—for the poor, of course—of

these fat, useless birds. Venice would lose more by this economy than she did by the stealing of her "Winged Lion," for this symbol of her departed strength was restored to its mosaic arch and background; but nothing could render to the modern Venetians that morning scene (of gratitude, goodness, and confidence, enacted in the north-western corner of the Ducal Piazza) whose daily sight has fashioned them—once haughty and hard-hearted—in the kind and graceful people we have seen.

But let us pass from the place to the palace of the Doge. In their ante-chamber is, next to a dark Tintoretto, in the darker volutes of deep carved oak, that rigid face of bronze, which no man can pass without looking, nor look without a shudder. For centuries the children of the proudest families learned to dread that flat face, more dangerous than Medusa's, till its mouth, wide open to dilation and distrust, disintegrated the once most cohesive republic.

Further, let us follow these processions; they fill the eye with the smoky light of the *auto da fé*, the ear with the cries of agony, the nose with the smell of charred flesh. Fed on such impressions, what became of the nation which up to Charles V. had no superior in bravery, navigation, mathematics, surgery, metallurgy, engineering, irrigation, etc.? They lost without regret all their superiorities, threatening the government only when it did not supply them with human tortures and bull-fights.

Will it be said that this is past history, as irrevocable as ghost stories? But all images are evokable, particularly when they have been set up unavoidable before the sight of youth; everywhere the same physiological causes will produce the same psychic effects. Therefore I say, beware, here and at this very hour to substitute for the sight of the busy and dramatic ocean that of any low spectacle or institutions; in the present instance that of a Custom-house, whose predatory character cannot fail to impress the youth with aspirations antipodal to self-reliance and self-exertion. For, as long as this fleecing work is done under shanties, it cannot have attraction for children; but once transferred to some elegant or imposing structure on the brightest spot of the sunny bay, there is danger that it may become the ideal of others than broken merchants and double-dealing detectives. Man is shaped by the impressions of his childhood.

Therefore I conclude: since there is no future without an ideal, do not let the monuments, places of public resort, schools, parks, study and playgrounds, be so arranged as to produce on children lowering impressions; and, conversely, do not leave on the gateway of the city any of these contrasts which shock the sense of propriety of strangers, because the first impression persists, and we are too often judged by the worst side of these discordances, not by their best.

Thus, at the very entrance of New York, and for a first impression of her, we must not allow the land to betray the water; let the Battery, that front-piece, be in all its parts homogeneous and fair; grand is its marine and its distant decoration, grand must be its portal; let both harmonize their lines and colors in a perspective which must vie with the souvenirs of Corinth and the actual beau-

ties of Venice. Otherwise we will furnish another testimony to the sad objurgation, "All is well coming out from the hand of nature, all is spoiled by the hand of man."

Reverting now to the primary object of these lectures, which is —I hardly need to repeat it—the adaptation of our parks to the wants of the education and training of our children, we have looked in vain for any beginning of this application in the works now progressing in the parks.

On the Tompkins Square the administration, taken with a sudden fit of shame, hastens to level these grounds, which nothing could have upturned as they are, but the ardent coöperation of folly and knavery, and tries to bury costly stones and 80,000 dollars under the present levelling.

This precious level of twenty acres will be made in walks, intersecting grass-plots dotted with trees, after the fashion of Union and Madison Squares. That is sober, and as devoid of imagination as of educational motives, on the plea that a popular park is fit for use when the trees and plants are divested from their properties, even of their name. Happily, this plan is so empty of cumbrance that some of the grass-plots—those of the interior, for instance—may easily be converted into botanical and flower beds, and more water added here and there for use, for demonstration of hydraulics, and for agreeable display.

Will the city fathers—Fathers Saturns!—consider that in the dense population, which expects a park where they have made a desert, there are above twenty thousand children waiting for a play and instruction ground? Their home is narrow, the neighborhood uninteresting; the park as planned will be a flat to their eye, and a flatness to their mind; they will look for an idea in it, and, finding none, will resort to their ordinary solution, that it has been planted in order to give them something to destroy. In this they are not fools; children want something to do, good or bad; you have the choice, they will accept it. This new park will be respected, nay, loved, by the children, if it brings them some respectable and lovable idea. If, for instance, the trees and shrubs bear their names, usages, provenance, etc.; if some parts of the ground contain (every year in rotation) a part of the book of natural history, whose summer reading in the park would be prepared by some winter drawings on the black-board, magnifying images from the camera obscura, and explanations,—could not some instruction be given them on the relations of vegetable and animal life; and therefore on the duties of man toward the vegetals which breathe vital air in his nostrils? We entertain these children with abstractions like "progress," or mythologies, like Elysian fields, etc.; and we neglect to make them feel, as with the finger, their natural relation to the vegetable world, so beautiful when truly *seen*, whose perpetuation is the *sine qua non* condition of the continuity of men on earth.

In the Central Park there is no trace of anything begun for children, though there is enough of empty ground.

A museum of art is in progress, though all such things ought to be built outside, as are the new Museum of Natural History and

the Lennox Library. Well, the surrounding grounds will show the same sempiternal grass-plot, with its bushes and trees without a name, instead of being planted, in conformity to the destination of the museum, with plants, creepings, flowers, etc., which could serve as models to the aspiring artist and artisan.

There are no beds of plants arranged for the study of their kind, usage, properties; no collection of rocks, even of those remarkable ones found on the spot; no trial at acclimation of febrifuge or other useful trees or plants.

Though one may suppose that every inch of this ground has been measured, there is no trace of these measurements which, taken by the metrical system, would give the lesson most needed at the present point of our national education.

Why not have marked along the roads, and particularly where the children run races, the centimetre, metre, kilometre, etc.; where they play ball on Saturday, the ares, hectares, etc.; on the cups and basins of the public fountains, their countenance in decilitres, litres, hectolitres, etc.; this done in the parks, the children themselves would ask for it in their class-rooms and play-grounds, where they would soon teach it to their tardy routine teachers. I know that the scientific employés of the parks are aware of the importance of these improvements—which would teach through the senses what could not reach the mind otherwise—but they must expect orders. Here is a sore larger than the quagmire of Tompkins Square.

If anything can save our parks from similar disgrace in the future, it will be the objective presented for their improvement of making them the main agent and field of the garden-schools of physiological education. That is the idea which need be hammered till it enters, not only the skull, but the brain.

If this idea of garden-schools is sophistical, no effort will be able to realize it; but if it is physiological—that is, true to human nature—it will come out from the seeds sowed in its prepared ground, our parks.

Moreover, we do not pretend to rest inactive in this Mohammedan confidence, but to directly bring forth the means of realization of the garden-schools.

Looking first to the obstacles, we find in the front rank those opposed by routine; but they are not worth combatting in themselves, in their representatives either, because they daily die away with those who leave off teaching, and will not reënter the school with our young, well-trained teachers.

We find more substantial the obstacles opposed to the mobilization and aeration of the pupils by distances. In fact, distances represent time—a factor in education second only to the paramount one, health.

But when a want is felt, or a needed discovery brought out, the universal law of "*fitness*" intervenes, at the same time and place, to provide the means of execution. True, if the two—the new idea and the means of execution—are not timely put *en rapport*, the new idea, instead of taking its practical form and substance, is in danger of falling in deliquescence among the abortions of the mind. But this fate cannot overtake the idea of garden-schools, because the

means for its execution have come out exactly when they are wanted, and we mean to urge their opportune concourse for the "*mobilization of the school and of the scholars.*"

As electricity came, almost to order, to help steam in girdling the world with an intellectual belt, so, in the apparently smaller sphere of education, the means of rapid transit are just beginning to be organized, when the idea of teaching from nature demands for its execution the concourse of ample and almost instantaneous transfer of the pupils from the school-room to the school-garden.

Willing to see nothing else in that aerial and almost Icarian monopoly but the means of giving wings to the old turtle, we claim for education the revifying influence of locomotion. Not a new element in training, since in the early *Renaissance*, and yet in the time of William Harvey, the students did not deem their studies ended till they had assimilated to themselves the learning of several universities; and likewise the "companions" did not stop travelling and settled as "masters" in their guild till they had gathered in their hand the handicraft of several countries. I hope we will come to that again, and that, profiting by the facilities of the new modes of transportation, this old method of learning will have its second *Renaissance* on an immense scale.

As for the application of steam transport to elementary education, nothing is altogether so opportune, so simple, and so just. Nothing is so just as to give almost gratuitously to our children the right of travelling on all the city roads, and on the elevated railroad in particular, to and from their places of instruction and training; for it would be at best a feeble compensation for the capital and interest they will have to pay for services rendered before they were either born, or of age to benefit by them otherwise. But to be generous: The schools demanding the use of the cars when they are little needed by the public; children not occupying half the room alloted to adults; the presence of teachers at each end of the cars relieving the company of special responsibilities; there being but one stoppage at the point of destination, the expense of fuel and machinery would be lessened; the collection of the fares being made in a lump for large numbers, would cause several economies; for all these reasons the elevated railroad and other means of city conveyance would make a great deal of money by taking almost every day from ten to forty thousand children away in the pure air and back for two cents. If some of them could not pay even that little, two or three times a week, they could, nevertheless, be carried with their fellows by means which would not hurt their feelings.

The official relations of the school with the roads would be of the simplest character. The superintendent of the schools would telegraph shortly after nine o'clock the number of children to be carried to the parks, museum, etc. Before ten the means of conveyance would be in readiness at the appointed stations, to return the children either before one o'clock, for the afternoon session, or about four o'clock, to go home. This service would necessitate, if any, one more employé, a "chief of the movement" of the pupils.

On the part of the schools, it is the only means of giving life to

the present automatic training; of finding room for the 25,000 applicants who found none at the last opening; of preventing the epidemics and contagions contracted or developed in the schoolroom when it is crowded, unswept by the rays of the sun and the four brooms of the wind. Moreover, since locomotion has become a *besoin* in civil, commercial, and political life, and ranks as a new factor in warfare, the school is not at liberty to let out of the curriculum the art of moving individually and in masses, with precision and method, *sang-froid* and security; that art must be acquired early by all, the schooling in the open air will be its opportunity, as the evolutions to, in, and from the elevated railways, its central means of training. Down with snail education!

On the part of the elevated railroad managers, it would be a smart piece of policy to connect the new era they open to locomotion with the new era in education, characterized by the training of all the functions, those of activity and *coup d'œil*, as well as those of thought and memory; and to accept the part offered them in the reformation of our school system; because it would give them large annual receipts, with an appearance of generosity which would dispel or weaken the storm of public opinion gathering fast and thick over their track.

I would have much more to say on the subject, but for once this will suffice.

The points touched have each their importance. First, to present the reasons for not obstructing the face of the city toward the sea. On the contrary, for decorating the Battery in a style worthy the place it occupies in our annals; impressible to the stranger, and inspiring to the youth a desire to rank among the men who have by their industry made this sea-port one of the sights of the world.

Second, to reaffirm the right of the school system of this city, State, and country, to the use of public grounds in education, and to the active concourse of their managers in the adaptation of parks, grounds, waters, museums, etc., to the training and teaching of children.

Third, to show the necessity and the possibility of using the elevated railroad, and others, to transport our children from the shut-up schools to the garden-schools, and other places of out-door instruction and exercise.

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The Apothecary is a vial fellow.—*Yonkers Gazette.*—In fact, a very pestle-nt fellow.—*Porcupine.*—These be mortar-fying facts.—*Yonkers Gazette.*—The above prescriptions were carefully compounded.—*Hackensack Republican.*—You all ought to be taken and well shaken, for the apothecary is one of the principal pillers of society.—*Boston Commercial Bulletin.*

The apothecary is a very good fellow, particularly useful to night editors and other persons who keep late hours and fall into the habit of taking a little somethin'. "The longer I live," said Sydney Smith, "the more I am convinced that the apothecary is of more importance than Seneca; and that half the unhappiness in the world proceeds from little stoppages from a duct choked up, from food pressing in the wrong place, from a vexed duodenum, or an agitated pylorus." THE SANITARIAN agrees with Sydney Smith.

SUICIDE NOT EVIDENCE OF INSANITY.*

By the Hon. O. H. Palmer, of New York.

Proceedings of the New York Medico-Legal Society, March 6th, 1878. The Hon. George H. Yeaman, President, in the Chair.

While the Jews and Persians share in our horror of suicide—for they set the highest value upon the earthly existence—a totally different feeling obtains among the Chinese, Japanese, Hindoos, Fijians, American Indians, Malayans, and other nations. With these the superior blessings of the future life over those of this, form a part of the popular religious belief. The taking off of one's self, under certain circumstances, is viewed as an act not merely pardonable, but heroic. To pretend that he who commits it under such predispositions and surroundings is *non compos mentis* is clearly absurd. Says Elam, in his work entitled "A Physician's Problems": "In our former investigations, also, we judged of the degeneration of the people in part by the excess of crime and the great frequency of suicide, but we cannot with propriety apply that test to the Oriental people; we cannot consider their statistics as equally significant with the records of crime in Western nations, seeing that many of those acts which with us are referable to crime or mental alienation, are, amongst the Orientals, to be considered as attached to mistaken notions of morals and religion, or as originating in peculiar legislative enactments."

Says the Abbé Huc, in his "Chinese Empire": "It is almost impossible to imagine the readiness with which the Chinese commit suicide. It requires only the merest trifle or a word to induce him to hang or drown himself, these being the two kinds of suicide most in favor. In other countries, when a man wishes to avenge himself on his enemy, he tries to kill him; in China he kills himself. There are various reasons for this. In the first place, the Chinese government holds the person responsible for the crime of suicide who gave the offence which caused it. It follows from this that, if any one wishes to avenge himself on his enemy, he has but to kill himself to work him the direst woe. He falls into the hands of the executive, who at least torture and ruin him, if not take his life. The family of the suicide, likewise, generally obtains large pecuniary compensation; and it is not rare to see wretched beings, who are devoted to their families, go and deliberately commit suicide at the house of some rich person."

This pagan custom of self-immolation, through family devotion, has its counterpart and following even in civilized and Christianized nations. What life-insurance man does not know that many insured persons have unquestionably done the same thing, relying on rich

* Continued from page 514.

insurance companies to provide for their families? This was not exactly the feeling of the Western gambler who, notwithstanding his clear apprehension of the question, declined to play at a game where he had to die to beat the bank.

The spirit of self-sacrifice for the benefit of those we love is as old as history and as fresh as to-day. Curtius plunged into the yawning gulf to save his country. The pelican, which picks its own bleeding breast to nourish its savage young, has been adopted as the symbol and the title of one of the largest life offices of Great Britain; and who shall speak other than reverently of that played-out rake who took his own life, after liberally insuring it, in order, as he said, to enable his widow to start again with a younger and more vigorous man?

Hecker records, in his "Epidemics," that in the fourteenth century, during an epidemic of persecution of the Jews on the false and preposterous charge that they had poisoned the air and all the springs and wells, the poor Israelites deliberately immolated themselves by thousands. In some places they fired their own quarter of the town, and so perished. At Strasburg, two thousand were burnt alive in their own burial-ground. "At Esslingen, the whole Jewish community burned themselves in their synagogue; and mothers were seen throwing their own children on the pile, to prevent their being baptized, and then precipitating themselves into the flames." If ever there were the marks of deliberation and sanity attendant upon suicide, these cases present them.

Hegesias, a Stoic philosopher of the time of the Ptolemies, gained the title of "The Orator of Death," from the eloquence with which he preached contempt of life and the blessings of death. "So intense," says Lecky, "was the fascination he cast around the tomb, that his disciples embraced with rapture the consequences of his doctrine; multitudes freed themselves by suicide from the troubles of the world." The fashion at last attained so perilous an extension that Ptolemy had to banish the philosopher from Alexandria.

Among the examples given by Dr. Winslow, in his "Anatomy of Suicide," and Esquirol, in his essay on suicide in the "Dictionnaire des Sciences Médicales," are some which most conclusively show that while an individual may be prompted by a mesmeric sensitiveness, or other cause, to fall in with an epidemic of suicide, yet the act is wholly controllable. For instance: "The ladies of Miletus committed suicide in great numbers, because their husbands and lovers were detained by the wars. At one time there was an epidemic of drowning among the women of Lyons. They could assign no cause for this singular tendency; it was checked by the order that all who drowned themselves should be publicly exposed in the market-place. That at Miletus was stopped by a similar device. The ladies generally hung themselves, and the magistrates ordered that in every future case the body should be dragged naked through the town by the ropes employed for the purpose. *There were no more suicides;* the apprehensions of an outraged modesty were quite sufficient to check the suicidal epidemic, thus proving that it had been a mere stupid fashion, all the time controllable."

In the Vedas, the Scriptures of the Brahminic religion, the act is

not mentioned, but for ages it has received a distinct ecclesiastical indorsement in the approval of suttee, or widow-burning, and the blessings bestowed by the Brahmins upon those who have taken their own lives in what they regard as a good cause.

"If we wish to understand the religions of the ancient nations of the world," says Prof. Max Müller, "we must take into account their national character. Nations who value life so little as the Hindoos and some of the American and Malay nations, could not feel the same horror of human sacrifices, for instance, which would be felt by a Jew; and the voluntary death of the widow would inspire her nearest relations with no other feeling than that of compassion and regret at seeing a young bride follow her husband into a distant land. She herself would feel that in following her husband into death, she was only doing what every other widow would do, she was only doing her duty.

"In India, where men in the prime of life throw themselves under the car of Juggernaut, to be crushed to death by the idol they believe in; where the plaintiff who cannot get redress starves himself to death at the door of his judge; where the philosopher who thinks he has learned all which this world can teach him, and who longs for absorption into the Deity, quietly steps into the Ganges; in such a country, however much we may condemn these practices, we must be on our guard, and not judge the strange religions of such strange creatures according to our own more sober code of morality.

"Let a man once be impressed with a belief that this life is but a prison, and that he has but to break through its walls in order to breathe the fresh and pure air of a higher life; let him once consider it cowardice to shrink from this act, and a proof of courage and of a firm faith in God to rush back to that eternal source whence he came; and let those views be countenanced by a whole nation, sanctioned by priests, and hallowed by poets, and however we may blame and loathe the custom of . . . religious suicides, we shall be bound to confess that to such a man, and to whole nations of such men, the most cruel rites will have a very different meaning from what they would have to us. . . . They contain a religious element, and presuppose a belief in immortality, and an indifference with regard to worldly pleasures which, if directed in a different channel, might produce martyrs and heroes."

Thus, this master scholar shows us that not merely is suicide among the Orientals no evidence of insanity, but it is not even a crime.

Goethe, in his autobiography, says: "Suicide is an event in nature which, however much it may have been spoken and treated of, must still excite the interest of mankind and be re-discussed by every generation. Montesquieu assigns his heroes and great men the right to give themselves up to death whenever it may please them; for he says they certainly must have the right to close the fifth act of their tragedies at what point they please. However, the question is not now of such as have led an important life, have given up their days to serve an empire or the pursuit of freedom, and whom surely we cannot blame if, when the idea that animates

them disappears from the earth, they follow it into the hereafter, hoping to pursue it there. We have to do with such as, from dearth of action in the most peaceful condition in the world, through immoderate demands upon themselves, become offended with life. As this was my own condition, and I well know the pain I suffered, what effort it cost me to escape it, I will not hide my reflections on the various methods of self-destruction that one could choose from.

"It is something so unnatural that man should tear himself from himself—not only injure but annihilate himself—that he resorts usually to mechanical means wherewith to execute his design. When Ajax falls upon his sword, it is the weight of his body that renders him this last service. When the warrior binds his shield-bearer not to allow him to fall into the hands of the enemy, it is also an outward power of which he assures himself, only moral instead of physical."

Voltaire relates the following incident: "Some years ago, an Englishman named Bacon Morris, a half-pay officer and a man of much intellect, came to see me in Paris. He was afflicted with a cruel malady, the cure of which he could scarcely hope for. After a certain number of visits, he one day came to me with a purse and a couple of papers in his hand. 'One of these papers,' said he to me, 'contains my will, the other my epitaph; and this bag of money is intended to defray the expenses of my funeral. I am resolved to try for fifteen days what can be effected by the *regimen* and the remedies prescribed in order to render life less insupportable, and if I succeed not, I am determined to kill myself. You will bury me in what manner you please; my epitaph is short.' He made me read it, and it consisted only of the following two words from Petronius: *Valete, curæ*—Farewell, care."

To gather a few illustrations from the domain of romance, it may be remarked that the "melancholy Dane," although of doubtful sanity on other points, discussed the question "To be or not to be" with mental soundness and a clear apprehension of the subject; Romeo and Juliet deliberately and intelligently preferred death to earthly separation; and the historic ballad of "Villikens and his Dinah," which narrates how by "pizon" they died, makes no attempt to cast the charitable mantle of impaired intellect over the extremely logical young lady who chose death rather than a distasteful husband, or of her Villikens who "laid down by her side," who "drank that cold pizon and imejitly died."

My experience for the past five years in the investigation of cases of suicide has forced upon my mind the conclusion that but a comparatively small number of suicides, even in this country, is attributable to insanity.

While it may not be proper to say that suicide, like the small-pox or yellow-fever, is a disease, nor that it is contagious, yet there are times and states, so to speak, of the social atmosphere when the propensity seems to prevail to a most alarming extent—when man's attachment to life ceases, when shadows seem to pass over the bright side of his existence, when hopes of happiness or fortune are blighted, when misfortunes seem to multiply and become insurmountable, when life seems to have proved a total failure, when

pride and ambition have been blasted, it is then the wicked thought enters the mind that death is preferable to such a life, and the sad result, deliberately, intelligently, and ingeniously planned, follows. It is not insanity, but a deliberate purpose to escape ills which to the suicide seem overwhelming, and which he has not the fortitude to bear.

I have in my mind several practical illustrations to sustain this theory coming under my personal observation.

During the last year, a man of intelligence and culture, of mature years, with a wife and four children, to whom he was fondly attached, had the misfortune to get into financial difficulties, and saw bankruptcy and poverty staring him in the face, and the hand of want outstretched and ready to grasp the delicate form of a beloved companion and the tender pledges of their mutual love, and for them, and to drive the wolf from their door, he deliberately and intelligently laid his plans to protect them by the sacrifice of his own life. As he did not succeed, however, in his felonious attempt, but "still lives," I will not mention his name or place of residence. His family being absent for a few days, leaving only a woman servant in the house, he seized upon that occasion for the enactment of the tragedy. He was found in the morning by the servant in a comatose and unconscious state, in bed, with the covering drawn over his head, and a rubber bag containing a sponge saturated with chloroform near his nose and mouth. Medical aid was immediately called, and, after several hours of active treatment, consciousness was restored. It was then given out, as indicated by him, that the house had been entered by burglars for the purpose of robbery, and the victim drugged by chloroform. The theory advanced at the time, and acted upon by the police for a while, was that the robbers entered by a small closet window, which was found to be open, and made their exit by a door, the bolt of which was discovered to have been thrown back; that they had been alarmed by the brilliant light of a fire raging the night before not far distant, and escaped with a portion of their booty, which consisted of a little silver-ware and an article or two of jewelry, which were subsequently found in a drawer hid in a bush near the house, directly in line with the fire referred to, and covered by a cloth. The drawer had been taken from the buffet which had contained the silver. It was found by a small child of the victim a few days after the supposed robbery. This was a very plausible theory, and ought to have satisfied a reasonable public, and secured to the unfortunate victim the sympathy of his neighbors. But this is a very wicked world, and there is always a disposition when theories are put forth, however plausible on their face, to criticise, investigate, and test them. So in this case and in this neighborhood there were doubting Thomases, who would insist upon thrusting their probes into this theory. It was suggested:

1st. If the thieves were frightened by the light, it would have been very stupid in them to have run directly towards it to deposit their booty.

2d. Whether a burglar was ever known, when stealing silver from a buffet, to take the drawer containing it and cover it with a

cloth, instead of wrapping the silver in the cloth, so as to convey it without noise?

3d. Why they should take a single coat of the victim to cover the drawer, without disturbing any of his other garments?

4th. Why the pocket-book of the victim, which was upon the mantel in his room, was undisturbed?

5th. Why his wife's wardrobe, which consisted of costly silks and laces, in a closet in the same room, remained untouched?

6th. Why the servant, who slept in a room on the opposite side of the hall, was unmolested?

7th. Worst of all, how it happened that the rubber bag, which was afterwards positively and emphatically identified, and found to have been purchased by the victim himself shortly prior, could have been used for the nefarious purpose by the burglars?

8th. How it happened that the victim was found by the disagreeable doctors to be under the influence of morphine as well as chloroform? and

9th, and last, whether a man retiring in conscious sanity can be chloroformed without being awakened in the process?

I will not say how much force there is in this last suggestion. That is rather a conundrum of the doctors for the doctors. It is enough to say, the man is sound and sane; the police were called off, and no trace of the burglars could be discovered; but it was found that his life was insured to the amount of some $50,000, and that most of his policies were of recent date.

With a little more morphine or a little more chloroform, here would have been another case for a coroner's verdict of suicide while laboring under "temporary aberration of mind," and a chance for an intelligent jury, actuated perhaps by the purest sympathy, but under the erroneous belief that the man must have been insane or he would not have committed suicide, to have put their hands on several bloated corporations, and to have vindicated the claims of the widow and orphans; in other words, by sympathy and error to have robbed innocent policy-holders and rewarded rascality.

A very striking case also occurred in Connecticut in the summer of 1872. It was pretty thoroughly discussed in the Connecticut papers at the time, and the facts disclosed in its investigation were peculiarly interesting. I refer to the case of Captain George M. Colvocoresses. He was a Greek by birth. Having lost his parents in the Greek revolution, he was picked up as a waif by one of our naval officers, brought to this country and educated in the naval service, remaining in that service for many years. At this time, however, he had been relieved for reasons which it is not necessary to explain, and was residing at Litchfield, in the State of Connecticut.

In January, 1872, a life insurance agent got information that Captain Colvocoresses was desirous of securing a large line of insurance on his life, and it was not long, therefore, before the agent put himself in communication with his customer. The reason given by the Captain to the agent for wishing to secure a large insurance was that he had a suit against the Department at Washington for a large amount of prize money, something over a hundred thousand

dollars, and as he might lose the suit, he had made up his mind to place as much insurance upon his life as the amount involved in the suit. He did not care to have the policies issued before the middle of January, and in all cases wanted to have the premiums made payable semi-annually. Through this energetic agent, and by his own efforts and applications, he secured, in twenty different companies, an insurance upon his life amounting in the aggregate to $195,500.

This was the first act in the drama. The next was to die before a second premium became due. He had exhausted his resources, and, of course, the speculation would fail unless the second act was performed in time. He occupied a high social position. His resources had mainly melted away in bad investments, and the ladder which had kept him and his family well up, was in danger of being swept away. Their was no avoiding a sacrifice, and the chivalry of race and profession secured the victim. On Wednesday, the 29th of May, 1872, he left his house in Litchfield, saying that he was going to New York, taking with him a russet leather valise, a small black satchel, an umbrella, and a bamboo sword-cane. His scheme was to be apparently murdered, and this was his outfit. Instead of going to New York, he stopped at Bridgeport, where the *dénouement* was to occur. For some weeks he had been on the go, like the Wandering Jew, up and down the earth, to find the time, place, and occasion, hesitating, doubtless fearing; but finally the act must be performed without further delay, and Bridgeport was the chosen spot. His part had been thoroughly studied. He feared that suicide would void his policies, for his attention had been called to that subject by the trial of a case involving the question whether death was the result of suicide or murder, and which he had watched with an intense interest. He stayed some days in Bridgeport, and finally took passage on the boat for New York, engaged his state-room, and deposited in it the russet bag, and then left the boat with the sword-cane and black bag in his possession. He went to the hotel with these articles at about half-past nine in the evening. He remained about the hotel till just half-past ten o'clock. The boat was to sail at eleven o'clock. He started apparently for the boat, stopped at a drug-store and got a couple of sheets of paper, and inquired the best route to the boat. He was seen to turn into Clinton street, a narrow street, about twenty-five minutes to eleven. At eleven a pistol-shot was heard in the street, where his body was immediately found. It appears that, after leaving the drug-store, he had taken the black bag to a spot near the dock, cut it open with his knife, which was afterwards discovered, taken out his pistol, which was an old, heavy one, out of date and rusty, gone back to Clinton street, bent his sword-cane nearly double over a picket-fence, unbuttoned his coat and vest, placed the pistol against his breast with one hand, and fired while he held open his coat and vest with the other—the blaze setting fire to his shirt, by the light of which he was speedily discovered. There was no evidence of any struggle, and the report of the pistol instantly brought several persons to the windows overlooking the street. and no one but himself was in the street at the time. The noise made by bending the sword-cane was distinctly heard by a neighbor. I will not take up

your time by going more minutely into the many interesting details; but it is enough to say that the surrounding facts and circumstances left no doubt upon the mind of any intelligent, disinterested man that the theory of murder was a humbug, nor that it was anything but a case of deliberate suicide by a sane man. Yet such is the state of public feeling upon the question of suicide, that the insurance companies were afraid to trust it to the decision of a jury; and, rather than run the risk of losing the whole amount of this fraudulent insurance, they compromised by the payment of about one-half of the claim.

With a healthy and intelligent public opinion no such fraud could be consummated nor outrage perpetrated. You will excuse me for speaking strongly on this subject. In my judgment, this demoralization of public sentiment is a disgrace to our civilization. While the sentiment which moves us to protect the weak against the strong is worthy of the highest commendation, a feeling that ennobles human nature when intelligently exercised, I have no sympathy with its abuse and perversion; nor should it be permitted, at this day and age, to encourage the perpetration of crimes, or legalize frauds.

(*To be continued.*)

Prizes Competitive in Hygiene.—*Prix proposé par la Commission de l'hygiène de l'enfance.* Question: De l'allaitement artificiel (artificial feeding). The value of the prize will be 1,000 francs; it will be awarded in 1879, and the essays must be sent to the Academy before the 1st of May, 1879. They must be written in French or in Latin, and should be accompanied with a sealed envelope containing a motto or device, and the name and address of the author. The *Journal de Médicine et de Chirurgie Pratiques* states also that of the fifteen prizes offered for 1879, two, besides the one above mentioned, are for questions relating to hygiene. A prize of 2,000 francs for the best study of the "Modifications, the alteration of functions, and the organic lesions that may be attributed to acclimation in men and animals"; and 2,000 francs for the best study of the means by which a larger share may be given to the *moral* treatment of cases of insanity.

The Itard prize for 1876 was awarded for the best essay on "*Les Aliments d'Épargne*" (Economy in Diet). Medals were also granted, in 1876, to those who contributed to advance the work of the commission appointed to improve the hygiene of infancy: To the 1st, a gold medal; the 2d, a silver medal; the 3d, a bronze medal, and to the 4th, an honorable mention.

For 1877 the *Prix Portal* was given for the best study of the question: "Existe-t-il une pneumonie caséeuse indépendante de la tuberculose?" (Is there a cheesy form of pneumonia independent of tuberculosis). During 1877 also medals were granted to those who rendered efficient aid to advance the work of the commission appointed to improve the hygiene of infancy. T. P. C.

Editor's Table.

Wash-basins and Water-closets.—Thousands of city dwelling-houses and offices, frequently destitute of almost all other conveniences, display their elegantly set Wash-basins and Water-closets as show-cards. And all over the country, by cistern, pump, or other means, these city houses and offices have their imitations, all purporting the utmost regard for cleanliness, while in reality, as ordinarily constructed and set, they are emblems of filth, by reason of the facilities they afford for the accession of sewer gas into living-rooms and sleeping apartments. Ostensibly the S and U traps on waste pipes are barriers between the cesspool or sewer on the one side, and the external or interior air of rooms on the other; but if the cesspool or sewer is insufficiently, or—as commonly—wholly unventilated, the so-called trap is a sewer-gas vent, a trap only in the sense of entrapping the unwary tenant. Sewer-gas conforms to a natural law of air and gases—always takes the course of least resistance. And in traps of small calibre, especially when not ventilated, it matters little whether they are filled with water or not; if filled, the gas bubbles through them with almost as much facility as it would pass if they were empty.

All water-traps act on the principle of a syphon, and when run at full bore by sudden flushing, as they commonly are, the increased current creates a vacuum below the trap which sucks out sufficient water from the trap to leave it unsealed. And this action, if on the same line of pipe, is equally applicable to a series of traps on different floors, or on the same floor, the use of the trap nearest the sewer commonly unseals all the traps above it, and the greater the decline of the pipe, the more likely is the syphonage to occur.

Another common means of syphonage is by the lodgement of some foreign substance across the bend of the trap, such, for example, as a wisp of paper or a few threads of wash-cloth, hanging one end in the trap and the other over the bend—such a substance will act as a syphon and completely empty the trap. Evaporation of the water is also a common means of unsealing traps, particularly in warm rooms, where the basin or closet is not in daily use; and frequently during the night, after the office or counting-room is closed. More-

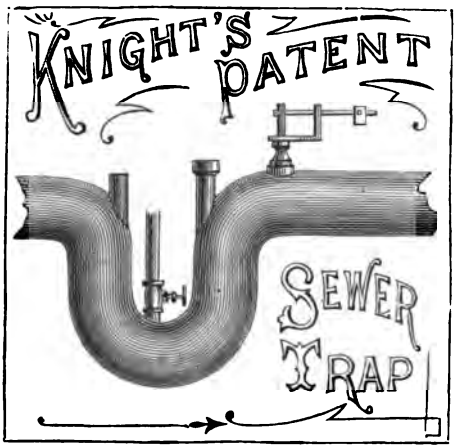
over, in the use of a trap, if from imperfect construction or other cause any foul water is left in the bottom, it will speedily infect a resupply; and a mass so held will evolve foul gases with the same facility as if there were no trap at all. *Unclean* traps are worse than none. For cleansing sink-traps, especially, they should be flushed at least twice a week with boiling water, which will melt all the grease, and effectually clear them.

Purporting to remedy the dangers of unventilated house-sewers and cesspools, there are innumerable devices, called traps, comprehending all sorts of cranks, valves, bells and balls, which are, for the most part, aggravations of the difficulty they are designed to overcome. Valve-traps, as a rule, are less efficient and less secure than water-traps. They are not only liable to leakage, but to obstruction from slight causes, and to speedy corrosion. Indeed, so uncertain and inefficient are traps in general, that persons are not wanting who advocate their entire abolition, holding that the dangers of traps are greater than their benefits, and that free ventilation without them is a safer reliance.

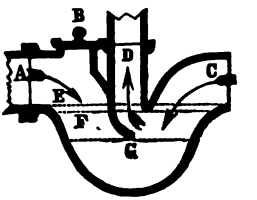
Nevertheless traps are frequently useful, even with the best possible ventilation, which should always be required, traps or no traps. The rush of cold air through the untrapped pipes of water-closets, wash-basins, and sinks is far from being pleasant, even when not tainted with effluvium, as it is always liable to be; and against this evil, which is not devoid of danger, a properly constructed water-trap is a useful barrier. Even valve or flap-traps are sometimes useful as sewer-traps, especially, against the backflow of water and the compressed gas carried before it in sewers surcharged with storm-water or tidal inflow—conditions criminally common to most of the sewerage systems in the United States, and likely to continue so until the time arrives when people are educated up to the necessity of separate systems of works for sewage proper, and for surface-water.

Owing to the difficulty and sometimes impracticability of having ventilating tubes attached to all basin and closet-traps throughout a house, some people have been wise enough, and it would be well if all were, to have stop-cocks put on all the basin waste-pipes just below the junction of the overflow connection, to be shut off when the house or room is unoccupied. If the practice were general, there would doubtless be fewer cases of typhoid fever "brought home from the country" among those who return to their homes which have been closed for the summer. Against this danger, especially, considerable ingenuity has been exercised in the invention of sewer-traps, to be applied on the soil-pipe of the house, as a barrier be-

tween the gases from the main sewer and the house waste-pipes. Of many devices exhibited for this purpose, in competition for a prize offered by the American Institute at its last exhibition, Knight's and Stewart's were pronounced the best.



STEWART'S NEW SEWER-GAS TRAP.



C—Outlet to street sewer.
D—Vent to connect with rain-water leader, chimney-flue, or independent pipe (which is preferable) to open air.
B—Hand-hole fitted with cover.
A—Main drain from house.
E—Ordinary level of water.
F—Level below which vent-pipe commences to discharge gas.
G—Lowest level necessary to trap.

Each of these received an award, but the special prize was not given, as neither of them, in the opinion of the judges, came up to the condition of being the best known to them "in or out of the exhibition."

Ventilation is the *sine qua non* to be insisted upon for all mechanical contrivances against sewer-gas poisoning. As a rule, the ventilating tubes and shafts attached to water-traps are too small; they should be, at least, half the diameter of the waste-pipes with which they are connected, and whenever practicable they should be carried up on the outside of the house, above the roof; and special care taken that the terminus be apart from all sky-lights, house-ventilators, and chimney flues. Moreover, the main soil-pipes of houses, and indeed all the pipes connected therewith, whenever practicable, consistent with protection against freezing, should be carried on the outside. The common practice of carrying the soil-pipe through the whole length of the cellar, and thus giving the house the largest degree of exposure, may often be avoided—particularly in corner houses—by taking it at once through the rear wall and across the yard. It would, indeed, be a great improvement on the healthfulness of houses generally, as well as the keeping of sidewalks, if all house-sewers were required to connect at the rear of houses and across the yards, instead of at the front. The traps would then be placed nearer the junction of the sink waste-pipe, and the ventilating shaft, which should be two or three inches

in diameter (half the size of the soil-pipe), could be carried up against the rear wall on the outside, instead of through the house, or disfiguring the front.

All things considered, all wash-basins and water-closets had better be trapped; and, whenever possible, each trap should be separately ventilated, in addition to the sewer-trap for the main soil-pipe, which should be made obligatory by law. The ordinary S basin-trap affords little or no protection, for reasons already stated. It is manifest that the plugging of the ordinary basin is of no use if the trap be defective, as the gas finds accession through the perforated overflow. Of several devices for overcoming the accession of sewer-gas through wash-basins, "Boyle's New Departure Valve Wash-Basin" is the best. The waste of this basin is shut off by a hollow trap plunger of such dimensions that when the water rises in the bowl and in the valve chamber, which communicates freely with it, to a certain height, the displacement of the plunger is sufficient to float it up from its seat and allow the water to escape from below. The lower edge of the plunger dips into a channel made around the top of the waste-pipe, so as to form a bell-trap of about an inch seal, so that when the valve is raised there is still left a sufficient seal to guard against any escaping gas. But even this, for perfect safety, should have a ventilating pipe communicating with a point near the outlet of the bowl leading to the open air; thus provided, and the plunger closed, it admits of no possible syphonage, vacuum, or evaporation, and may be considered as safely trapped as if cut off by a stop-cock. The trap can be opened and cleansed whenever necessary, by simply unscrewing a plate on the top of the marble slab. The bowl, with its valve chamber, consists of a single piece of decorative poreclain, equally compact with basins in common.

For convenience, under circumstances sufficiently explained by the cut, Jenning's "Tip-up" wash-basin is also of great utility: providing always for needful ventilation.

For certain confined places, such as small dressing-rooms and ships' state-rooms, etc., the J. L. Mott Iron Works have recently introduced a variety of enamelled-iron toilet ware, which,

for excellence, elegance, durability, and compactness, excels any hitherto known to the trade. Among these articles are wash-basins in great variety, suited to all places. Some especially adapted to narrow hallways and closets, which fold in or turn up so compactly as to show a projection of only three or four inches, representing ornamental panel work in bronze or marble, and yet inclosing a commodious wash-basin, provided with both hot and cold water faucets, and supply and waste pipe couplings, and well trapped.

Wash-basin closed.

Wash basin open.

Urinals, also, particularly adapted to private bath-rooms, billiard-rooms, &c., constructed on the same principle, and equally well fitted, so ornate as to actually add to the beauty of the apartments in which they are set.

Urinal closed.

Urinal open.

A good water-closet, properly connected with a well ventilated sewer, is, unquestionably, one of the most comfortable and healthconducive implements of domestic refinement. It is cleanly to a degree, surpassing all other means of removal of objectionable matter to a place of safety, or beyond the scope of danger.

The requirements of a good water-closet may be concisely stated to be—simple in construction, not liable to get out of order, work efficiently with a minimum amount of water, and inodorous; conditions which would unquestionably condemn nine-tenths of the water-closets commonly found in use, as intolerable and dangerous nuisances.

All that has been said of the necessity of ventilation to basin-traps applies with redoubled force to water-closets, the traps and sewers connected therewith; in short, without efficient ventilation all in-door water-closets and urinals should be absolutely prohibited.

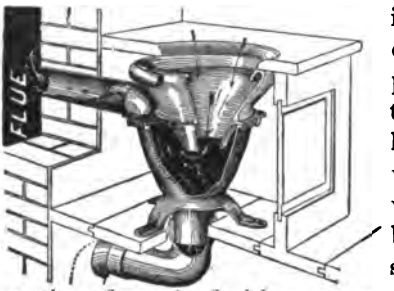
Water-closets, although made in almost endless variety, may all be divided into two classes, namely, those with simple traps and those with traps and valves.

The common hopper closet, with simple trap, now best made of iron, cast in one piece, enamelled inside, is almost described by its name. An arm is cast on the margin of the hopper, near the top, for the insertion of the supply pipe, set in putty, and the water commonly admitted by a valve worked with a perpendicular spindle, on the end of which the hinged seat presses when in use. But owing to the common inadequacy of the flush of water the inside of the hopper is generally filthy, and the trap is rarely or never completely emptied; hence, even with the best possible ventilation, it is unfit for in-door use. It is suited to out-of-door setting, or in yard closets, with doors opening to the outer air, inasmuch as the plan upon which it is constructed admits of its being set deep enough in the ground to be out of danger from frost. It should be flushed daily, by pouring down several pailfuls of water.

Pan-closets, in their various modifications, probably comprehend not less than nineteen-twentieths of all the water-closets in use throughout the United States. They are so well known as to scarcely need description; but, briefly, they consist of four parts: 1, The basin, which is usually made of earthenware; 2, the pan, usually made of copper, and turned by means of a crank attachment to the handle; 3, the receiver, made of cast-iron, in which the pan works; and 4, the simple S trap. When set, and in working order, the pan retains about a pint of water, so that the lower edge of the basin dips into it, and thus forms a superficial water-trap. The matter deposited in the pan of water is retained until the handle is raised to the full extent, by which means the contents are dumped into the receiver, and carried with the flush of water through the opening at the bottom of the basin into the trap, and thence to the soil-pipe. The effect of this mechanism is that the receiver and the back of the pan speedily become coated with filth, insomuch that it is the common practice of plumbers, who are called upon to remedy the stench arising from this cause, to remove the receiver, burn out the stench, and again replace the same receptacle, the householder meanwhile neither understanding the nature of the temporary palliation, nor his stench-trap which the plumber perpetuates! And with such closets are most of the hotels, boarding-houses, tenement-houses—common and the new fashionable kind in New York called "Flats"—furnished; some of them with hundreds of these show-cards to the most facile way to disease and death! No amount of trap ventilation can remedy such collections of filth above the trap. The emanations therefrom pervade every part of the house, are breathed; absorbed, in part, by the drinking-water, and in part settle down into the food utensils and the food itself;

and thus the filthiest of all filth becomes the daily bread of the occupants of all such houses.

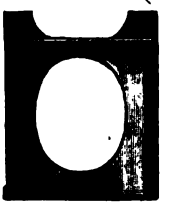
One of the earliest and best improvements on the hopper and pan closets is the Odorless Water-Closet, invented several years ago by Mr. R. D. O. Smith, of Washington, D. C. It consists of an earthenware bowl which projects into an iron receiver, which receiver, however, contains no pan or working parts within it, being tapered and trapped the same as an ordinary hopper closet, and set in the same way; but the top of it is provided with a flat cover, and out of this, by the side of the projecting bowl, springs a ventilating tube. Emanations from the foul hopper or trap, by a well-known property of moving gases, cling to the surface, ascend to the *cul-de-sac* under the flat top between the projecting neck of the bowl and the receiver, then find means of escape through the ventilator. It is the best cheap closet in the market.



With an abundant water supply, such as most American cities are provided with, no house can be considered well plumbed which is not provided with improved water-closets, such as the Jennings', Zane's, and Demarest's.

DEMAREST'S PATENT WATER-CLOSETS (J. L. MOTT IRON WORKS).

Closet with Trap.



Slop or Urinal Safe for Demarest's Water-Closet. Enamelled or galvanized.

Closet with Offset.

These, in common, essentially consist of basins and traps cast in one piece, or are made trapless, relying upon the large flush of water and perfect ventilation to completely clear and deodorize themselves every time they are used. These closets are so constructed as to wholly escape the soiling of the bowls common to other closets, and fœcal matter dropped into a large quantity of water is well known to be almost immediately deodorized; consequently these closets can be multiplied in the same building to

JENNINGS' PAT. W. CLOSETS.

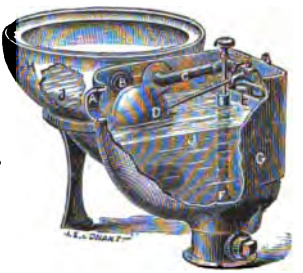
IRON TRAP.

ALL E. WARE.

an almost unlimited extent without contaminating the atmosphere.

It should be observed, however, that no matter how perfect water-closets may be, all apartments in which they are placed should have openings to the external air. They should never be placed in the accidental corners or closets of badly constructed buildings; they should be taken into consideration at the very outset of building plans, and thorough ventilation provided for from the start, with openings near the ceiling for the discharge of foul air, and near the floor-level for the admission of fresh air.

J. ZANE & CO'S. PATENT WATER-CLOSET.



D is the loaded float or ball.
C is the self-closing ball-cock.
F is the Solid Plunger.

The water supply, and the relation of water faucets to other uses, are matters of extreme importance. Water is known to be exceedingly prone to absorb impurities from the atmosphere. Hence, open-mouthed faucets for portable water in the vicinity of water-closets are dangerous things. The safest way, in a sanitary point of view, is to have no such exposures to either water-closets or sinks; never to have the water-closet supply drawn direct from the house-supply, but each closet provided with a separate tank, so that there may be no danger of contaminating the drinking water, or of impairing the practical working of any other closet.

Earth-Closets suggest themselves as the best modern conveniences where there is not water carriage, and the best made are the "Wakefield" and "Perfection." These are constructed in various

Wakefield.

styles of finish; but in all so as to avoid dust and the least degree of untidiness. But the earth should not be kept dried, reused again and again, as some enthusiasts in their favor have advocated. The earth is undoubtedly a good temporary absorbent of offensive

odors, but its power of disinfection is both feeble and slow; hence the reusing, or too long keeping, of earth, with excreta mixed in it, is not to be regarded as necessarily devoid of danger because it is odorless. Notwithstanding, earth-closets have a large field of usefulness in villages, and in public institutions throughout the country, as a facile means of disposing of excreta without nuisance, and with ordinary care without detriment to health.

The American Public Health Association, ere this number of THE SANITARIAN goes to the mail, will have convened in Richmond for the declared duty of devoting its attention exclusively to the investigation of the epidemic of yellow fever now but just over, and the means of preventing its recurrence in the future. It is scarcely necessary to observe that to confine the attention of an association, constituted as this one is, to the consideration of any one subject, will require great skill on the part of the chairman, notwithstanding the intensity of public interest in the subject for the *exclusive consideration of which* this meeting has been convened. It has been so much the habit of the Association hitherto to be a mere audience to a few chosen speakers, there is some reason to fear the effect of bad example. This it should be the effort of every member to restrain. There is enough, and more than enough, of *the one subject* to command the attention of the Association for the whole session, and it cannot afford to disappoint public expectation, which it will be sure to have done, if its labors result in the expression of opinions and generalities, instead of specific practical facts. An abstract of the proceedings may be expected in the next number of THE SANITARIAN.

Health: and How to Promote It, is the taking title of a book by Richard McShery, M.D., Professor of Principles and Practice of Medicine in the University of Maryland, soon to be brought out by Messrs. D. APPLETON & Co.

Yellow Fever. WASHINGTON, November 9th, 1878.

Abstract of Sanitary Reports received during the past week under the National Quarantine Act:

New Orleans.—There were 11 new cases of yellow fever, and 143 old cases, reported for the week ended yesterday evening. For the past twenty-four hours no new cases and 2 deaths. Quarantine raised on the 5th inst. Total cases 13,406, subject to revision. Total deaths, 4,010.

Morgan City, La.—There were 8 cases of yellow fever, and 3 deaths, during the past week. Total cases to yesterday evening, 571; deaths, 105.

Mobile, Ala.—During the week ended yesterday evening, there

were 35 cases of yellow fever, and 9 deaths. Total cases, 259; deaths, 68.

Pass Christian, Miss.—Seven new cases of yellow fever, and 1 death for the past week. Total cases, 196; total deaths, 21.

Ocean Springs, Miss.—For the week ended yesterday noon there were 4 cases of yellow fever, and no deaths. Total cases, 150; deaths, 30.

Hernando, Miss.—Ten cases of yellow fever, and 5 deaths, for the week ended Nov. 2d. No cases, and one death, during the past week. Total cases, 175; deaths, 69.

Dry Grove and Lebanon Church neighborhood, Miss.—Since Oct. 19th, there have been 13 new cases of yellow fever, and 8 deaths. No new cases, and but one death, for the week ended Nov. 6th. Total cases, 125; deaths, 52. Crystal Springs, Miss., near Dry Grove, has so far escaped the fever.

Memphis, Tenn.—During the past week there were 33 deaths from yellow fever. Total deaths to the evening of the 7th, 2,997.

Chattanooga, Tenn.—Nine new cases of yellow fever, and 4 deaths, during the past week. Total cases to yesterday evening, 444; deaths, 133.

Cairo, Ill.—During the two weeks ended yesterday there were 8 new cases of yellow fever, and 3 deaths. The last case occurred on the 4th, and the last death on the 6th inst. Total cases, 83; not including some doubtful cases. Total deaths, 44. Heavy frost the 8th inst.

Vicksburg, Miss.—There were 11 deaths from yellow fever during the past week. No deaths during the past twenty-four hours. Six deaths during the week in the country near Vicksburg.

Delta, La.—Four deaths from yellow fever during the past week.

Decatur, Ala.—During the week ended last evening there were 8 cases of yellow fever, and 1 death. Total cases, 196; deaths, 43.

Gallipolis, Ohio.—No new cases of yellow fever since Oct. 26th. The last death occurred Oct. 27th. Total cases, 65; deaths, 37—not including six deaths which occurred on the steamboat *John Porter*.

Key West, Fla.—No yellow fever since Oct. 13th. The United States troops returned to Key West on the 7th inst.

Havana, Cuba.—Twenty-four deaths from yellow fever and 4 from small-pox for the week ended Nov. 2d.

Lambayeque, Peru.—For the week ended Oct. 12th sporadic cases of yellow fever are reported.

Martinique.—There were no deaths from preventable diseases in the Island of Martinique during the week ended Oct. 9th.

Bermuda.—During the two weeks ended Oct. 29th there were 6 deaths from all causes out of a population of 15,293, including 3,218 military and naval force. The bark *Blackpool*, which left Bermuda quarantine for England Oct. 22d, had three or four cases of yellow fever on board.

Japan and China.—Dr. Simmons, Sanitary Inspector for the Japanese Government for the port of Yokohama, reports, under date of Oct. 10th, that he regards the occasional reported cases of cholera in Japan during the past summer as cholera morbus, and not malignant or Asiatic cholera. On the 2d of October, however, malignant cholera broke out in Nagasaki, and in eight days there had been 58 cases and 10 deaths. Cholera has existed in Shanghai, China, for several months, and as Nagasaki is the first port of Japan entered by vessels from Shanghai, Dr. Simmons regards the outbreak as a new importation, but owing to the lateness of the season and the sanitary measures instituted by the Government he does not anticipate a spread of the disease.

Europe.—In 149 cities and towns of the German Empire, having an aggregate population of 7,369,009, there were, during the week ended October 12th, 5,470 births and 3,539 deaths from all causes, being an annual death-rate of 25 in 1,000 of the population. Wiesbaden shows the lowest death-rate, 11.2; and Chemnitz the highest, 33.8. The total deaths include 80 from enteric fever, 127 from scarlet fever, and 154 from diphtheria. No deaths occurred from cholera, yellow fever, small-pox, or typhus fever.

Vienna, Austria.—During the two weeks ended October 19th, 700 deaths are reported out of a population of 727,271, being an annual death-rate of 25.03 per 1,000 of the population. The total deaths include 15 from small-pox, 5 from enteric fever, 11 from scarlet fever, and 46 from diphtheria.

Hamburg.—During the week ended October 12th there were 53 deaths from typhus fever, 10 from scarlet fever, and 39 from diphtheria and croup.

Great Britain.—In 23 large cities and towns of the United Kingdom, having an aggregate population of 8,373,953, there were 6,095 births during the week ended October 19th, and 3,371 deaths from all causes. In 21 of these cities there were 14 deaths from small-pox, 184 from scarlet fever, 22 from diphtheria, and 90 from fevers, principally enteric.

JNO. M. WOODWORTH,
Surgeon-General U. S. Marine Hospital Service.

Death-rates per 1,000 inhabitants, annually, from all causes; and from causes which are usually preventable.

POPULATION AND REGISTRATION AT MOST RECENT ESTIMATES AND DATES.	Total No. of Deaths from all Causes.	Per 1,000.	Deaths under 5 years.	Consumption.	Small-Pox.	Diphtheria.	Scarlatina.	Measels.	Croup.	Whooping Cough.	Typhoid & Type Fevs	Malarial Fevers.	Diarrhœal Diseases.	Puerperal Diseases.	Still-births.
New York, 1,084,500—4 weeks ending Oct. 19...	2009	24.10	896	350		73	48	7	36	39	33	45	241	13	167
Philadelphia, 950,900—4 weeks ending Oct. 26...	1065	15.90	350	171		52	49	1	36	6	35	9	27		71
Brooklyn, 528,000—4 weeks ending Oct. 19	558	20.31	408	122		74	12		37	19	9		82	8	68
St. Louis, 500,000—4 weeks ending Oct. 26.....	427	10.89	173	52		21	2		13	3	8	88	14	4	28
Chicago, 460,000—4 weeks ending Oct. 26.	554	15.74	150	61		49	11		37	15	15	16	23	2	43
Baltimore, 365,000—3 weeks ending Nov. 2.....	376	17.90	143	53		31	12		8	2	11	2	12		40
Boston, 363,000—4 weeks ending Oct. 26.....	584	20.80	237	110		39	6	4	14	4	7		68	6	
Cincinnati, 280,000—3 weeks ending Oct. 19.....	252	15 16	96	34		13	38		3	1	3		16	2	19
San Francisco, 300,000—month of September..	384	14.56	127	53		20	2		5	3	10		25		24
New Orleans, 210,000—4 weeks ending Oct. 20...	337	13.91	259	27		1					2	*86	7		22
Washington, 160,000—month of September.....	308	27.73	135	59		10	3		1	3	14	16	22		30
Pittsburgh, 145,000—month of October.....	300	22.0	135	25	3	94	6		1	7	13		11	2	15
Newark, 126,000—.....															
Providence, 100,000—month of October.	160	19.20	62	18		32	5		6	4	8		6		8
Richmond, 77 000—4 weeks ending Oct. 6.....	122	20.07	58	21		4	5				2	2	9		25
New Haven, 60,000—month of October.....	82	16.4	26	12		15	15		7	1		1		3	8
Charleston, 57,000—4 weeks ending Nov. 2.....	101	23.09	27												9
Milwaukee, 123,600—month of.....															
Mobile, 40,000—month of September	78	1.9	23	13							1	3	2		15
Dayton, 36,000—4 weeks ending Oct. 31.....	39	13.69		6		1			1			1	1		
Nashville, 27,000—month of October.....	65	23.98	23	8		1					2	6	5		3
Wheeling, 28,000—.....															
Buffalo, 170,000—.....															
Rochester, 70,000—month of October.....	95	15.97	22	10		1			1						12
Paterson, 40.000—month of September.....	66	20.75	29	10		5	1			1			8		
Petersburg, 20,000—.....															
Selma, 8,000—.....															
Elmira, 20,000—month of October.....	34	20.0		2		17							3		
Yonkers, 18,500—month of October.....	19	13.09	6	2		1	2						2		1
Memphis, 45,000—.....															
Detroit, 125,000—..... ..															
Syracuse, 60,000—month of October.....	59	11.57		12		1			3		4		1		4
Reading, 40,000—															
Sacramento, 25,000—month of September.....	44	21.41	10												4
Minneapolis, 44,000—month of.....															
Bowling Green, 6,000—.....															
St. Paul—.....															
Cleveland, 162,000—4 weeks ending Oct. 19.....	280	22.45	105	27		85	2		8	2	6	1	11	1	16
Erie. 27,000—month of October.....	27	11.07		4		3	2								1
Jacksonville, 10,000—.....															
New Brunswick, 16,660—30 days ending Oct. 14.	31	22.64	15												
Toledo, 50,000—month of October.	57	18.68	28	4			3		4	1		1	3		4

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Correspondents under this head are particularly requested to forward their communications *regularly*.

* Yellow Fever, 547.

Literature.

Deterioration, and Race Education* is the title of a book which is evidently the result of extensive research by one thoroughly imbued with the spirit of philanthropy, and determined to bring to the surface the appaling prevalence of human depravity, with the view, if possible, of ameliorating it by education—an education which shall take cognizance of the vices of mankind and fortify the individual against them. Drunkenness, idleness, pauperism, vice, crime, insanity, and disease are here aggregated by an array of statistics which ought not, and cannot, fail to arrest the attention of all thoughtful persons on the welfare of mankind, whatever the sphere of observation. The vice of all others, the most prevailing and the most deteriorating, is intemperance; it is the great plague of the age, more prevalent and more malignant than any other which has ever prevailed. The heredity of "this scourge of humanity" is summarized from the writings of Morell, Elam, and Maudsley, from the first of whom is given the following example of a single family:

"In the first generation: immorality, depravity, excessive alcoholism, and moral torpor. In the second generation: hereditary drunkenness, mania, and general paralysis. In the third generation: sobriety, hypochondria, monomania of being persecuted. In the fourth generation: little intellect and homicidal tendencies; at the age of sixteen fits of mania, stupidity, transition of idiocy, and extinction of the race." Morell further says: "I constantly find the children of drunkards in the asylums for the insane, in prisons, and in houses of correction. The deviation from the normal type of humanity shows itself in these victims by the arrest of the development of their constitutional system, as well as by a vicious intellectual disposition and cruel instincts."

Elam remarks: "The children of the poor, where this evil tendency remains uncorrected by a good physical and moral education, the surroundings are vicious, and want and misery irritate a weakened constitution, the consequences of drunkenness in the

*By Samuel Royce. 12mo, pp. 585. Boston: Lee & Shepard. New York: Charles T. Dillingham.

parent are aggravated, and hence the frightful amount of insanity among the poor."

Maudsley says: "Drunkenness in the parent is a cause of idiocy, suicide, or insanity in the offspring, as also insanity in the parent may occasion dipsomania in the offspring, which conclusively proves the deep-seated deterioration of the nervous system arising from drunkenness, the close attendant of pauperism."

The author fortifies himself throughout his work by a liberal use of accepted authorities, showing extensive research in the prosecution of his theme; but he neglects to make any allowance for the progress of inquiry, or to notice the recent summaries of the progress of sanitation by Chadwick, Richardson, and others, which show in England an actual saving of 50,000 lives of school children *annually*, compared with the losses forty years ago; a reduction of the army death-rate from 17.5 per 1,000 to 9.6; of the navy from 6 to 4.9; and in the transport services to a much greater degree. In the same line of inquiry the author might have learned of immense life gains in the public service of other countries—our own among the rest—have taken some notice of the terrible mortality which formerly obtained in the mercantile marine, as compared with the present, and in immigrant vessels in particular, where the mortality forty years ago was more than ten times as great as it is now. In prisons—English prisons especially—the gain has been equally marked. Throughout England typhus, which formerly infested both prisons and courts, has now become a rare disease; and English prisons are now more healthful than were English palaces half a century ago. Notice should also have been taken of the gain due to the progress of sanitation among the working classes, in English cities in particular, and in many continental cities, by the improvement in dwellings. Nor, indeed, is the progress in life-saving by any means limited to these special classes. In England the gain is general—pervades the whole population. According to the conclusions of Mr. Chadwick—Address on Health, Aberdeen, 1877, and published in THE SANITARIAN, January to June, this year—the sickness and death rates in most old cities have been reduced by at least one-third during the last forty years.

While the same degree of progress does not obtain in other countries as in England, there are nevertheless many examples both at home and abroad, prominent among which is New York, notwithstanding the great room for improvement which still exists. This improvement is most marked and most significant in the improved viability of children. Measured by the reports on vital statistics in the Health Department for the nine years ending with 1875—since

the administration of systematic scientific sanitation—there has been a steady decline in the percentage of deaths under five years of age from 53 to 48.28, a decline which, in the last of the nine years, is equal to the saving of 2,960 children.

Such examples—and the category might be considerably extended—are important exceptions to the rather too sweeping conclusions of the work under review. Notwithstanding, there is abundant scope in the prevalence of preventable disease, insanity, vice, and crime throughout the country, aye! throughout the world, calling for the exercise of the utmost energy on the part of every thoughtful person for the welfare of his race. And the remedy urged, that which the author calls *race education*, is alike the most commendable and the most practical of any which has hitherto been suggested. It consists in the removal—the abrogation—of causes by industrial education. He shows that the primary function of education is the preservation of the race, and that healthy bodies and healthy minds, trained in self-culture, are the true antidote to idleness and pauperism, and their congeners. The work is altogether the most valuable and practical contribution to social science which has hitherto appeared, and commendable to the attention of all educators of youth, and all students of social science.

The Value of the Sanitarian, Index Number.—No one who receives this number of THE SANITARIAN should fail to look over the index of the volume which it concludes, as an evidence of its value and a promise for the future. It would be an easy matter to briefly review the progress of sanitary science in the United States since the advent of THE SANITARIAN, six years ago, and to claim some credit for it. But THE SANITARIAN has been so well introduced to the public, and continues to receive monthly such a generous welcome by the press, as to render any such effort wholly unnecessary. Sample copies will be sent anywhere for *thirty cents*, and everybody knows the subscription price is *three dollars a year, in advance.* Notwithstanding, a number of promises to pay have been indulged, and some there are not yet fulfilled. These

Delinquent Subscribers, who have imposed upon our generosity, are now under a double obligation to promptly remit for both the past and the future.

Subscriptions for 1879 are now due, and many good subscribers we have who will need no other reminder; for they appreciate not only the value of THE SANITARIAN, but enjoy it to the full, in the satisfaction they feel at having paid for it.

"Black List."—Would you believe it? *The Huntington Bulletin* is publishing a "Black List," which contains the names of parties who have been reading the paper for periods ranging from five to seven years without offering a cent in return to the needy editor. "And here," remarks the *Long Island City Star*, "is where a little tar and feathers could be used without exciting much public indignation. Make no mistake! We mean upon the rascally delinquents."

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